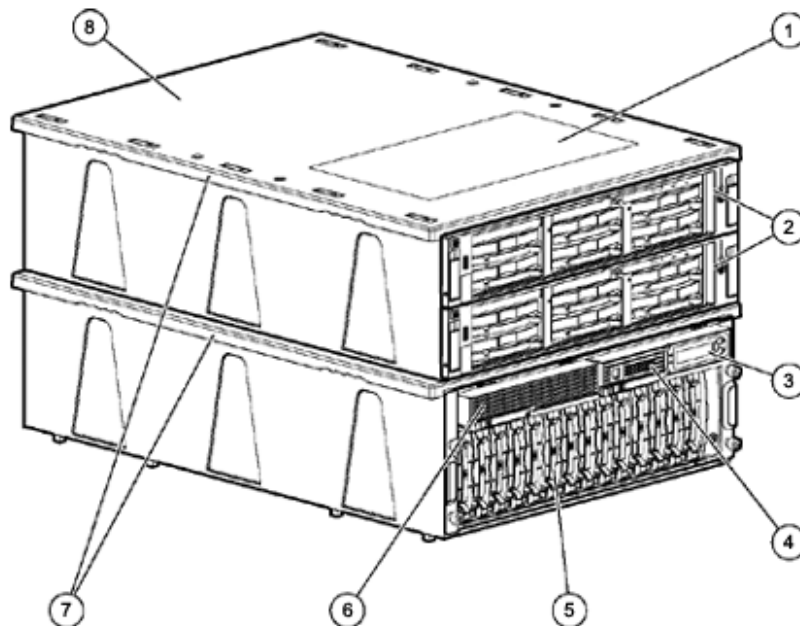


### Overview

### HP ProLiant DL380 Generation 4 (G4) Packaged Cluster with Modular Smart Array 1000



1. Cluster Component Label
2. Two 2U Servers
3. MSA1000 Controller
4. MSA1000 Controller LED

5. 4U MSA1000 Shared Storage with 14 1" Hot Plug Hard drives Bays
6. Redundant MSA1000 Controller Bay
7. Lifting Rails
8. Configuration Fixture

### What's New

- Features (2) DL380 G4 Xeon 3.6 GHz, 2M cache Servers
- Redundant Fans Standard in servers
- Configure-To-Order (CTO) capability is offered by HP inside sales

### At A Glance

### Overview

- Features (2) DL380 G4 servers with up to 2 Xeon 3.6 GHz, 2MB cache processors
- Now features the HP StorageWorks Modular Smart Array 1000 (MSA1000) storage system
- Now features the MSA1000 SAN Switch 2/8
- Now features (2) HP 2 Gb Fibre Channel Host Adapters (FCA2214)
- Now supports U320 SCSI 10K and 15K rpm Universal Hard Drives

The HP ProLiant DL380 Generation 4 Packaged Cluster with Modular Smart Array 1000 is a member of the ProLiant Packaged Cluster Family and extends the current product lineup with the addition of the HP StorageWorks Modular Smart Array 1000 Storage System (MSA1000).

The DL380 G4 Packaged Cluster with MSA1000 combines the power and reliability of the ProLiant DL380 G4 server with the high performance and scalability of the MSA1000 storage system. In standard configurations, the DL380 G4 Packaged Cluster with MSA1000 offers the convenience of pre-installed storage and server components in a single package. The innovative shipping box simply opens and allows for quick setup while leaving the servers and storage readily accessible in the Packaged Cluster 8U fixture. Colorful configuration and setup guides quickly explain the process of connecting storage, networking and power cables. Once initial setup has been completed, the packaged cluster may be quickly re-packaged for deployment at another site or facility, or simply removed from the 8U packaged cluster fixture and installed in an HP rack with the enclosed universal rail kits.

The MSA1000 combines the array controller shelf and the drive shelf, which holds up to fourteen 1" universal disk drives in a single 4U rackmount cabinet. More storage can be easily deployed with the addition of up to two HP StorageWorks MSA30 disk enclosures with space for forty-two drives giving maximum storage capacity of 12 TB when using the new 300 GB drives. The packaged cluster may be used with Microsoft Windows® Server 2003, Windows 2000 and Linux operating systems for standard and clustered configurations. The performance and scalability of the MSA1000 allows for up to 18 additional ProLiant servers to be connected providing maximum return on investment and minimal storage management costs. The ProLiant DL380 G4 Packaged Cluster with MSA1000 includes:

- Two DL380 G4 Servers (1 processor per server) plus the MSA1000 storage system combined in an 8U configuration fixture.

#### 2-HP ProLiant DL380 G4 (per server) features:

- Integrated Lights-Out (iLO) Management standard on system board
- Intel Xeon 3.4 GHz or 3.6GHz processors with 64-bit extensions, a 800MHz Front Side Bus and 1 MB or 2 MB of L2 cache
- Intel E7520 Chipset
- Integrated Ultra320 Smart Array 6i Plus Controller with 64MB RAM and optional 128MB Battery-Backed Write Cache (BBWC) Enabler option kit
- Three available 64-bit PCI-X slots, including two non-hot pluggable 100MHz slots and one non-hot-pluggable 133MHz slot and optional PCI-X Hot-Plug cage and Optional PCI-E Non-hot plug Cage (2) x 4
- NC7782 Dual Port PCI-X 1000T Gigabit Server Adapter (embedded)
- Support for up to six 1" Wide Ultra3/Ultra320 SCSI hot plug hard drives or for five hot plug hard drives and one DAT hot plug tape drive
- Optional dual channel drive backplane
- Internal hot plug capacity 1.800 TB standard (6 x 300 GB 1" HD)
- 575-Watt Hot Plug Power Supply (with optional redundancy)
- Hot Pluggable Redundant Fans
- Quick Deploy Rail System includes sliding universal rails and an ambidextrous cable management arm for easy serviceability and in-rack tool-less access to major components
- USB 2.0 support one port up front and two port in back
- Automatic Server Recovery (ASR), ROM Based Setup Utility (RBSU), HP System Insight Manager, Status LEDs including system health and UID and SmartStart

#### 1 MSA1000 Storage:

### Overview

- 4U Rack Mount Fibre Channel Storage, and one MSA1000 controller (redundant optional)
- Support for HP Ultra2, Ultra3, and Ultra320 Universal 1" Drives
- 14 hot plug drive bays, up to 2 TB storage (with 146 GB drive)
- Scaleable up to 12.6 TB of storage (42 x 300 GB drives) via HP StorageWorks Modular Smart Array 30 (MSA30) disk enclosures (each MSA30 provides 14 hot plug drive bays)
- 2 Gb Fibre Channel host connections (support for 1 Gb and 2 Gb Fibre Channel fabrics)
- Embedded 8-port 2 Gb Fibre Channel Fabric Switch (redundant optional)
- RAID-ADG (Advanced Data Guarding)
- Battery-Backed 256-MB cache, upgrade to 512-MB cache
- Hot Plug redundant power supplies and fans
- Compatible with ISV backup and restore software from Hewlett Packard, VERITAS and others
- Tool-less rack-rail included supports round and square hole racks
- Protected by HP Services, including a three-year, Next Business Day, on-site limited Global warranty and extended Pre-Failure Warranty, which covers processors, memory, and hard drives - Certain restrictions and exclusions apply.

### Standard Features (DL380 Generation 4 Packaged Cluster with MSA1000)

|                            |   |
|----------------------------|---|
| <b>Packaging</b>           | 8U Configuration Fixture - Recyclable ABS material<br>Unique cabling with positive identification (secured to storage configuration fixture)<br>Two 5 meter Fibre Channel cables<br>One 6 foot Ethernet cross over cables   |
| <b>Documentation</b>       | Cluster set-up poster and configuration guide   |
| <b>Server</b>              | ProLiant DL380 G4 Server (Qty 2)  |
| <b>Shared Storage</b>      | Modular Smart Array 1000 (Qty 1)  |
| <b>Software Components</b> | <p>The Packaged Cluster utilizes a single, consistent set of utility software for storage and RAID management, setup, configuration and troubleshooting. This consistency reduces the cost of ownership by reducing the training and technical expertise necessary to install and maintain your HP server storage solution.</p> <p><b>Configuration</b></p> <ul style="list-style-type: none"><li>• Array Configuration Utility (ACU) [On-line/Offline]</li><li>• Array Configuration Utility (ACU 6) [On-line, Remote Web-Based &amp; Off-line]</li><li>• Option ROM Configuration for Arrays (ORCA)</li><li>• Selective Storage Present (SSP)</li><li>• ROM based set-up Utility (RBSU)</li></ul> <p><b>Management/Health</b></p> <ul style="list-style-type: none"><li>• HP Systems Insight Manager</li><li>• Smart Start</li><li>• Management Agents</li><li>• Redundant ROM</li><li>• Remote Flash ROM</li><li>• Integrated Lights-Out Support</li><li>• Remote Insight Lights-Out Edition</li><li>• Automatic Server Recovery (ASR)</li><li>• Active Update</li><li>• ROMPaq, support software and configuration utilities</li><li>• Survey Utility and diagnostics utilities</li><li>• Drive Parameter Tracking</li><li>• Dynamic Sector Repairing</li><li>• Hot Spare Boot</li></ul> <p><b>(NOTE: Upon the event of a failed processor or VRM in a multi-processing environment, the system will automatically reboot and use the remaining good processor(s).)</b></p> <ul style="list-style-type: none"><li>• Pre-Failure Notification (covers processors, hard drives and memory)</li><li>• Optional ProLiant Essentials Value Packs: Rapid Deployment Pack, Workload Management Pack, Integrated Lights Out</li></ul> |

### Standard Features (DL380 Generation 4 Packaged Cluster with MSA1000)

#### OS Support

##### Microsoft Cluster Service (MSCS)

- Microsoft Windows 2000 Advanced Server
- Microsoft Windows 2003 Server, Enterprise Edition

##### SteelEye LifeKeeper for Linux

- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

##### HP Serviceguard for Linux

- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server

##### Novell Netware Cluster Service (NCS)

- Novell Netware

**NOTE:** For a more complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: <http://www.hp.com/go/supportos>.

**NOTE:** Please refer to compatibility matrix <http://www.hp.com/products/sharedstorage> for latest compatibility information.

**NOTE:** For a more complete and up-to-date information on Linux support, please visit HP Linux Web site at <http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html>.

**NOTE:** For more complete and up-to-date information on how to buy server operating systems from HP please visit the OS product site at: <http://h18004.www1.hp.com/products/servers/software/OEM.html>

#### Service and Support

Three-year limited warranty, including hardware diagnostic support, pre-failure warranty (coverage of hard drives, memory and processors). The warranty is fully supported by HP Services and a worldwide network of resellers and service providers. In addition 90-day's getting started software telephone support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services.

**NOTE:** Limited warranty includes 3 year parts, 3 year labor, 3-year on-site support

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses
- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMWare-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

HP Care Pack services include coverage for the HP branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as 22" and smaller external monitors and tower UPS options up to 3kVA; these items will be covered at the same service level and for the same coverage period as the server. Coverage of UPS Battery is not included, standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

### Standard Features (DL380 Generation 4 Packaged Cluster with MSA1000)

**NOTE:** For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/carepack>

**NOTE:** For more complete information on HP Services offerings, customers and resellers, please visit us at: <http://www.hp.com/hps>

**NOTE:** Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

### Standard Features (DL380 Generation 4 server)

**Processor (per server)** Intel Xeon Processor 3.6 GHz-2MB  
Intel Xeon Processor 3.4 GHz-1MB

**Cache Memory (per processor)** 2MB second level ECC cache (full speed)

**Upgradability (per server)** Upgradable to dual processing

**Chipset (per server)** Intel E7520 Chipset  
**NOTE:** For more information regarding Intel, please see the following URL:  
<http://www.intel.com/products/server/chipsets/.html>.

**Memory Protection (per server)** 2-way interleaved capable, Advanced ECC and Online Spare Capabilities

**Memory (per server)**

|          |  |
|----------|--|
| Type     | PC2-3200 DDR2 SDRAM running at 400 MHz |
| Standard | 1 GB (2 x 512 MB)                      |
| Maximum  | 12 GB                                  |

**Network Controller (per server)** NC7782 Dual Port PCI-X 1000T Gigabit Server Adapter (embedded)

| Expansion Slots (per server) | Slot Number | Bus Speed           | Bus Number* | Device Number** | Hot Plug | PCI Voltage |
|------------------------------|-------------|---------------------|-------------|-----------------|----------|-------------|
|                              | 1           | 64-bit/133MHz PCI-X | 10          | 1               | no       | 3.3 Volt    |
|                              | 2           | 64-bit/100MHz PCI-X | 6           | 1               | no       | 3.3 Volt    |
|                              | 3           | 64-bit/100MHz PCI-X | 6           | 2               | no       | 3.3 Volt    |

**\*NOTE:** Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.

**\*\*NOTE:** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).

**NOTE:** For more information regarding PCI-X, please see the following URL:

<http://h18004.www1.hp.com/products/servers/technology/pci-x-qa.html>

**NOTE:** All slots can accept universal keyed PCI cards

### Standard Features (DL380 Generation 4 server)

|   |  |  |  |
|---|--|--|--|
| <b>Storage Controllers (per server)</b> | Smart Array 6i Controller (Ultra320) (integrated on system board)<br>FCA2214 Host Adapter (Linux, Novell & 32-bit Windows) (1 per server for connectivity to the MSA1000)  |  |  |
|   | <b>NOTE:</b> For complete list of devices supported the Smart array 6i Controller see the following:<br><a href="http://h18000.www1.hp.com/products/quickspecs/12030_div/12030_div.HTML">http://h18000.www1.hp.com/products/quickspecs/12030_div/12030_div.HTML</a><br>(Worldwide)<br><a href="http://h18000.www1.hp.com/products/quickspecs/12030_na/12030_na.HTML">http://h18000.www1.hp.com/products/quickspecs/12030_na/12030_na.HTML</a><br>(North America) |  |  |

|                             |               |                                 |
|-----------------------------|---------------|---------------------------------|
| <b>Storage (per server)</b> | Optical Drive | 24x IDE CD-ROM Drive (Slimline) |
|                             | Hard Drives   | None                            |

|   |               |         |                        |
|---|---------------|---------|------------------------|
| <b>Maximum Internal Storage Type (per server)</b> | Hot Plug SCSI | 1.80 TB | 6 x 300 GB Ultra320 1" |
|---|---------------|---------|------------------------|

|                                |  |   |
|--------------------------------|--|---|
| <b>Interfaces (per server)</b> | Serial   | 1   |
|                                | Pointing Device (Mouse)  | 1   |
|                                | Graphics   | 1   |
|                                | Keyboard   | 1   |
|                                | External SCSI  | 1   |
|                                | 2 Gb Fibre Channel   | 1 (via FCA2214 Host Adapter, occupies one PCI slot in the server) |
|                                | Network RJ-45  | 3 (1 for iLO)   |
|                                | USB  | 2   |
|                                | <b>NOTE:</b> Please see the following URL for additional information regarding USB support:<br><a href="http://h18004.www1.hp.com/products/servers/platforms/usb-support.html">http://h18004.www1.hp.com/products/servers/platforms/usb-support.html</a> |   |

|                              |  |
|------------------------------|--|
| <b>Graphics (per server)</b> | Integrated ATI Rage XL Video Controller with 8-MB SDRAM Video Memory |
|------------------------------|--|

|                                 |   |
|---------------------------------|---|
| <b>Form Factor (per server)</b> | Rack (2U), (3.5-inch) per server, 8U configuration fixture for complete cluster |
|---------------------------------|---|

### Standard Features (DL380 Generation 4 server)

|  |  |   |
|--|--|---|
| <p><b>ProLiant Essentials Foundation Pack Software</b></p> | <p>HP Systems Insight Manager</p>                            | <p>HP's new HP Systems Insight Manager (HP SIM) helps maximize system uptime and performance and reduce system maintenance costs by providing proactive notification of problems before those problems result in unplanned downtime or reduced productivity. HP SIM are both easy to set up work with the Insight Management Agents, integrated Light-Out and Remote Insight Light-Outs Edition, and Version Control Agents to deliver robust fault, configuration, and asset management as well as remote administration. With HP SIM customers will also be able to take advantage of role-based security; the ability to manage ProLiant, Integrity, and HP 9000 systems; and plug-ins for storage, client, printer, and power management as well as server rapid deployment, performance management, and workload management. For more details on HP SIM visit <a href="http://www.hp.com/go/hpsim">http://www.hp.com/go/hpsim</a>.</p> |
|  | <p>SmartStart</p>  | <p>SmartStart is a tool that simplifies server setup, providing a rapid way to deploy reliable and consistent server configurations. For more information, please visit the SmartStart Web site at <a href="http://www.hp.com/servers/smartstart">http://www.hp.com/servers/smartstart</a>. SmartStart version supported (minimum): SmartStart 7.10.</p>  |
|  | <p>Management Agents</p>                                     | <p>The Management Agents form the foundation for HP's Intelligent Manageability strategy. They provide direct, browser-based access to in-depth instrumentation built into HP servers, workstations, desktops, and portables, and send alerts to HP Systems Insight Manager and other enterprise management applications in case of subsystem or environmental failures. For additional information about the Management Agents and other management products from HP, please visit the management Web site at <a href="http://www.hp.com/servers/manage">http://www.hp.com/servers/manage</a>.</p>   |
|  | <p>Subscriber's Choice</p>                                   | <p>Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides automatic delivery of software and driver change notifications for ProLiant products. Sign up at <a href="http://www.hp.com/go/subscriberschoice">http://www.hp.com/go/subscriberschoice</a> and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.</p>  |
|  | <p>ROMPaq, support software, and configuration utilities</p> | <p>The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options available in SmartStart or downloadable from Software and Drivers download pages, linked from the SmartStart website at <a href="http://www.hp.com/go/support">http://www.hp.com/go/support</a>.</p>  |
|  | <p>Insight Diagnostics Online Edition</p>                    | <p>The most advanced configuration analysis, reporting and troubleshooting utilities used by HP and at your fingertips, available in SmartStart.</p>  |

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|  |   |
|--|---|
| <p><b>Industry Standard Compliance</b></p> | <p>ACPI 1.0b Compliant<br/>PCI-X and PCI 2.2 Compliant<br/>WOL Support<br/>Microsoft® Logo certifications<br/>USB version 1.1</p> |
|--|---|

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### Standard Features (DL380 Generation 4 server)

|  |   |
|--|---|
| <b>Security</b>  | Power-on password<br>Keyboard password<br>Diskette drive control<br>Diskette boot control<br>QuickLock, Network Server Mode<br>Serial interface control<br>Administrator's password<br>Disk configuration lock  |
| <b>Server Power Cords</b>                                    | Four (4) total Lowline power cords ship standard (per cluster) – US, Japan, Europe.<br>Sixteen (16) total Lowline power cords ship standard (per cluster) – APD, GCD, PRC   |
| <b>Power Supply<br/>(per server)</b>                         | 575 Watt, CE Mark Compliant<br>Optional Hot Plug Redundant Power Supply Capability  |
| <b>System Fans<br/>(per server)</b>                          | Each server contains 8 hot plug fans standard.  |
| <b>Required Cabling</b>                                      | For required cabling information, refer to the HP Web site at:<br><a href="http://h18000.www1.hp.com/products/servers/ProLiantDL380/">http://h18000.www1.hp.com/products/servers/ProLiantDL380/</a> .   |
| <b>Factory Express Portfolio<br/>for Servers and Storage</b> | <p>HP Factory Express offers configuration, customization, integration and deployment services for HP servers and/or storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.</p> <p>Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging to meet customer needs. HP products supported through Factory Express include: HP Integrity, HP ProLiant &amp; Blades, HP 9000 servers and the MSA1000, VA7xxx, EVA3000 &amp; EVA5000, XP, rackable tape libraries and configurable network switches storage products.</p> <p>For more information on how to order please contact your sales representative or go to <a href="http://www.hp.com/go/factory-express">http://www.hp.com/go/factory-express</a>.</p> |

### Standard Features (DL380 Generation 4 server)

#### Rack Airflow Requirements

##### Rack 10000 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

**CAUTION:** If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- **Front and rear doors:** If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- **Side:** The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

**CAUTION:** Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

**NOTE:** For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL: <http://h18000.www1.hp.com/products/servers/ProLiantDL760/index.html>.

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#### Rack Kit (Servers)

Tool-Free support for racks with square mounting holes (including Compaq/HP 7000, 9000, 10000 and H9 series), with an adjustment range of 24" - 36".

**NOTE:** The Modular Smart Array 1000 tool-less rack rail included in the Packaged Cluster accommodates most round or square hole rack standard.

### Standard Features (Modular Smart Array 1000)

With the following components, your storage capacity and performance can be scaled to new levels:

#### Modular Smart Array 1000

The 4U cabinet houses up to fourteen 1" Universal hot pluggable Ultra2, Ultra3, and/or Ultra320 drives. Each MSA1000 includes the following standard components: (1) MSA1000 Controller, (1) MSA Fibre Channel I/O Module with a single SFP, dual hot pluggable fans/power supplies and power cables, (2) 3' VHDCI to VHDCI SCSI cables to connect expansion enclosures, documentation and a support software CD.

The modular design of the MSA1000 makes it possible to add redundant controllers, redundant single port Fibre Channel I/O Modules, 3-port hub, or embedded fabric switches and storage expansion enclosures. Additional storage enclosures may be added without power cycling the MSA1000.

#### MSA1000 Controller

The MSA1000 Controller is an integrated RAID controller with an LCD/LED status display and 256 MB read/write battery-backed cache (expandable to 512 MB per controller). One MSA1000 Controller is included with the MSA1000; a redundant MSA1000 Controller is an option.

##### Key Features

- Redundant controller support with mirrored cache
- Fabric, Private Loop & Public Loop Support
- Auto Negotiated F, FL & L Port Login
- RAID 0, 1, 1+0, 5 and ADG
- 2 Gb/1 Gb Frequency Agile
- Primary & Secondary Inter-Controller Link (ICL)
- Host based configuration via ACU
- Optionally configurable with Command Line Interface (CLI)
- Remote configuration and monitoring via ACU (offline and remote) & IM

##### MSA1000 Controller Management Features

- **Selective Storage Presentation:** allows multiple hosts to access a single MSA1000 storage system. Host access can be defined all the way down to a logical volume level.
- **Online RAID Level Migration:** allows for online post-configuration change to RAID level without destroying data or volume information.
- **Online Capacity Expansion:** lets you add storage to an operational MSA1000-reducing expensive server downtime.
- **Global Online Spare:** reduces the risk of data loss by facilitating automatic rebuilds after a drive failure.

##### Fault Tolerance

Several fault tolerant configurations which keep data available and servers running while drives are being replaced are supported including:

- **Advanced Data Guarding (RAID ADG):** Allocates the equivalent of two parity drives across multiple drives and allows simultaneous write operations.
- **Distributed Data Guarding (RAID 5):** Allocates parity data across multiple drives and allows simultaneous write operations.
- **Drive Mirroring (RAID 1, (1+0 Striped Mirroring)):** Allocates half of the drive array to data and the other half to mirrored data, providing two copies of every file.

### Standard Features (Modular Smart Array 1000)

#### Fault Recovery

Minimizes downtime, reconstructs data, and facilitates a quick recovery from drive failure:

- **Online Spares:** If a failure occurs, recovery begins with an online spare and data is reconstructed automatically. Multiple online spares can be assigned per array and used across multiple arrays. It is also possible to assign different online spares across different arrays.
- **Array Accelerator:** Onboard, battery-backed cache memory protects data in the event of a power failure. In the unlikely event of a controller failure, the battery-backed cache will save critical user data for up to three days.

|         |                          |   |
|---------|--------------------------|---|
| Storage | Drive bays               | 14 1" Hot pluggable   |
|         | Drive bays scalability   | Up to 42 hot pluggable drive bays via two MSA30 disk enclosures (14 drive bays per MSA30)   |
|         | Hard Drives              | None  |
|         | Maximum Internal Storage | Base MSA1000: 4.2 TB (14 x 300 GB Ultra320 1")<br>With one MSA30: 8.4 TB (28 x 300 GB Ultra320 1")<br>With two MSA30: 12.6 TB (42 x 300 GB Ultra320 1") |
|         | Hard Drive               | Pre-failure warranty  |

#### Storage Standard Contents

4U Modular Smart Array 1000  
 (1) MSA1000 Controller with 256 MB cache  
 (1) MSA SAN Switch 2/8 (integrated) (Includes four 2Gb SFPs)  
 Redundant hot pluggable power supply/fans  
 Redundant Hot Pluggable Power Supply/blower assemblies  
 Universal Rack-mounting Kit  
 (2) Power cables  
 MSA1000 Support CD & Documentation  
 Ethernet Crossover cable for clustering  
 Serial cable  
 (2) 3-ft VHDCI to VHDCI SCSI cables  
**NOTE:** The MSA SAN Switch 2/8 has a total of eight Fibre Channel ports. There are seven ports accessible by the user and the eighth is internal to the controller. Four SFPs are shipped installed in the Switch.

|                    |  |
|--------------------|--|
| Storage Controller | MSA1000 Controller, redundant controller capable |
|--------------------|--|

|                   |  |
|-------------------|--|
| Host Bus Adapters | FCA2214 Host Adapter (Linux, Novell & 32-bit Windows) (one per server) |
|-------------------|--|

### Standard Features (Modular Smart Array 1000)

|   |   |   |
|---|---|---|
| Cache Memory                                    | 256 MB Read/Write Cache<br>ECC protection, battery backed, removable  | Up to 512 MB Read/Write Cache (optional)<br><b>NOTE:</b> Optional storage memory allows the following configurations: 1x256 MB or 2x256 MB.<br><b>NOTE:</b> When redundant controllers are installed, the cache configurations in both controllers must be identical. |
| Cache Batteries                                 | Up to three days of redundant battery life, removed for easy replacement  |   |
| Upgradable Firmware                             | 2 MB flashable ROM  |   |
| Power Supply                                    | 499 Watt (Dual) Power Supply, CE Mark Compliant<br>Fans integrated into each power supply, Redundant Functionality (Standard) |   |
| Disk Drive and Enclosure                        | Ultra320, Ultra3 and Ultra 2 SCSI 1 inch Universal drives   |   |
| Form Factor                                     | Rack 4U, (7.0 inch)   |   |
| Connector Type                                  | 2 Gb or 1 Gb Fibre Channel  |   |
| Ports   | 2 VHDCI; Ultra3 SCSI  |   |
| Bandwidth                                       | >200 MB/s<br>>30,000 IO/s   |   |
| Disk Drive & Disk Enclosure Protocols Supported | Ultra3 SCSI and Ultra2 SCSI   |   |
| User Interface                                  | Controller display with Status Indicators (2) and Push Buttons (4) Status indicators on front of controller (16)              |   |
| MSA1000 Controller Protocol support             | 2 Gb Fibre Channel  |   |
| SCSI Ports                                      | 2 external VHDCI connectors standard for use for MSA30 disk enclosures  |   |
| Logical Drives                                  | Up to 32 logical drives   |   |

## Standard Features (Modular Smart Array 1000)

### RAID Support

- Raid ADG (Advanced Data Guarding)
- Raid 5 (Distributed Data Guarding)
- Raid 1+0 (Striping and Mirroring)
- Raid 1 (Mirroring)
- Raid 0 (Striping)

### Models

|   |                                 |  |
|---|---------------------------------|--|
| <b>DL380 G4 Packaged Cluster 3.6 GHz with MSA1000</b><br>381370-xx1 | <b>Processor(s)</b>             | (1) Intel Xeon Processor 3.6 GHz standard (up to 2 supported)  |
|   | <b>Cache Memory</b>             | 2 MB level 2 ECC cache   |
|   | <b>Memory</b>                   | 1 GB (Standard) to 12 GB (Maximum) of 2 way interleaved capable PC2-3200 400MHz DDR2 SDRAM, with Advanced ECC capabilities |
|   | <b>Network Controller</b>       | NC7782 Dual Port PCI-X 1000T Gigabit Server Adapter (embedded)   |
|   | <b>Storage Controller</b>       | Ultra320 Smart Array 6i controller (integrated on system board)<br>(2) FCA2214 Host Adapter (Linux & 32-bit Windows)       |
|   | <b>Hard Drives</b>              | None ship standard   |
|   | <b>Internal Storage</b>         | 1.8 TB (6 x 300 GB Ultra320 1") (with optional hard drives)  |
|   | <b>Optical Drive</b>            | 24x IDE CD-ROM Drive   |
|   | <b>Modular Smart Array 1000</b> | 1 Modular Smart Array 1000 with 14 1" drive bays. Includes one MSA1000 Controller, redundant optional                      |
|   | <b>Form Factor</b>              | Rack (2U), (3.5-inch)  |

|   |                                 |  |
|---|---------------------------------|--|
| <b>DL380 G4 Packaged Cluster 3.4 GHz with MSA1000</b><br>374110-xx1 | <b>Processor(s)</b>             | (1) Intel Xeon Processor 3.4 GHz standard (up to 2 supported)  |
|   | <b>Cache Memory</b>             | 1-MB level 2 ECC cache   |
|   | <b>Memory</b>                   | 1 GB (Standard) to 12 GB (Maximum) of 2 way interleaved capable PC2-3200 400MHz DDR2 SDRAM, with Advanced ECC capabilities |
|   | <b>Network Controller</b>       | (2) NC7782 PCI-X Gigabit NICs (embedded) PCI 10/100/1000 WOL (Wake on LAN)   |
|   | <b>Storage Controller</b>       | Ultra320 Smart Array 6i controller (integrated on system board)<br>(2) FCA2214 Host Adapter (Linux & 32-bit Windows)       |
|   | <b>Hard Drives</b>              | None ship standard   |
|   | <b>Internal Storage</b>         | 1.8 TB (6 x 300 GB Ultra320 1") (with optional hard drives)  |
|   | <b>Optical Drive</b>            | 24x IDE CD-ROM Drive   |
|   | <b>Modular Smart Array 1000</b> | 1 Modular Smart Array 1000 with 14 1" drive bays. Includes one MSA1000 Controller, redundant optional                      |
|   | <b>Form Factor</b>              | Rack (2U), (3.5-inch)  |

|                         |       |       |
|-------------------------|-------|-------|
| <b>Country Code Key</b> | XX=00 | US    |
|                         | XX=29 | Japan |
|                         | XX=37 | APD   |
|                         | XX=42 | EURO  |

### Configure To Order

**IMPORTANT:** The base cluster models listed above cannot be customized. If you require additional customization to the base cluster model, then you must use the Configure-To-Order process to receive a complete factory integrated cluster with options delivered in a single package. The Purchase Order must list each part number individually along with any options to begin the order. This should be communicated in advance with the HP sales or client services at 1-800-888-0292. See steps below for more details.

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#### Step 1: Choose 8U Configuration Fixture

HP 8U Configuration Fixture for Fibre cluster

378027-B21

**NOTE:** This ensures the cluster is delivered in a single package with all necessary documentation and cables. It will be delivered just like the base cluster model in an 8U configuration fixture for easy setup.

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#### Step 2: Choose two (2) DL380 servers

**IMPORTANT:** You must choose two (2) identical servers.

HP ProLiant DL380G4 Rack Chassis (North America)

371293-405

HP ProLiant DL380G4 Rack Chassis (Worldwide)

371293-B21

**IMPORTANT:** You must choose at least one (1) Fibre Channel Adapter (FCA2214) per server for storage connectivity.

Fibre Channel Adapter - FCA2214

281541-B21

**NOTE:** Not all server options are supported in the DL380 Packaged Cluster. For additional information on supported options, please contact Client Services at 1-800-888-0292.

Please refer to the DL380 G4 server QuickSpecs for information on CTO server models and options.

DL380 G4 server QuickSpecs: <http://h18004.www1.hp.com/products/servers/proliantdl380/index.html>

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#### Step 3: Choose one (1) Modular Smart Array 1000 System

HP StorageWorks Modular Smart Array 1000

201723-B22

Packaged Content includes:

- Modular Smart Array 1000 Chassis
- MSA1000 Controller with 256MB cache
- Redundant Hot Pluggable Power Supply/Blower assemblies
- Universal Rack Mounting Kit
- MSA1000 Support CD & Documentation
- Serial cable
- Power cables

**IMPORTANT:** You must choose at least one (1) MSA SAN Switch integrated option for SAN connectivity.

MSA SAN Switch 2/8 (integrated) - Includes four 2Gb SFPs

288247-B21

MSA Hub 2/3 (integrated) - Includes two 2Gb SFP transceivers

286763-B21

Please refer to the MSA1000 QuickSpecs for information on CTO model and options.

MSA1000 QuickSpecs: <http://h18006.www1.hp.com/products/stageworks/msa1000/index.html>

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### Options (DL380 Generation 4 Packaged Cluster with MSA1000)

|   |   |            |
|---|---|------------|
| ProLiant DL380 G4<br>Unique Options<br>(per server) | Hot Plug AC Redundant Power Supply Module (NEMA and IEC cords) (NA and Japan)   | 355892-001 |
|   | Hot Plug AC Redundant Power Supply Module (IEC cord) (WW)   | 355892-B21 |
|   | Floppy Drive Option Kit   | 364507-B21 |
|   | SCSI Configuration Kit  | 364471-B21 |
|   | PCI-X Hot Plug Riser Cage Option Kit  | 354676-B21 |
|   | PCI-Express Riser Cage Option Kit   | 354675-B21 |
| Processor   | Intel Xeon X3.6-2MB/800MHz Processor Option Kit   | 378751-B21 |
|   | Intel Xeon X3.4-1MB/800MHz Processor Option Kit   | 311583-B21 |
| Memory<br>(SDRAM DIMMs)                             | 1GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2 x 512 MB)  | 343055-B21 |
|   | 2GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2x1024 MB)   | 343056-B21 |
|   | 4GB of Single-Ranked PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2x 2048 MB)   | 343057-B21 |
|   | 4GB of 2-Rank Advanced ECC PC3200 DDR2-400 SDRAM DIMM Memory Kit (2x 2048 MB)   | 375004-B21 |
| Storage Rail Kit<br>(Round Holes)                   | Round hole rack cabinet rail kit  | 293052-B21 |
|   | <p><b>NOTE:</b> Supports for racks with round mounting holes (including HP rack systems/E and HP systems), with an adjustment range of 24"- 36".</p> <p><b>NOTE:</b> The standard storage rails already support most square and round hole racks.</p>   |            |
| ProLiant Essentials Value<br>Pack Software          | Rapid Deployment Pack, 1 User, V1.x   | 267196-B21 |
|   | <p><b>NOTE:</b> This license allows 1 server to be managed and deployed via the Deployment Server.</p> <p><b>NOTE:</b> Please see the following white paper to utilize Rapid Deployment on the Packaged Cluster:<br/> <a href="http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html">http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html</a></p>   |            |
|   | Rapid Deployment Pack, 1 User, V1.x (Japan)   | 267196-291 |
|   | <p><b>NOTE:</b> This license allows 1 server to be managed and deployed via the Deployment Server.</p> <p><b>NOTE:</b> Please see the following white paper to utilize Rapid Deployment on the Packaged Cluster:<br/> <a href="http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html">http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html</a></p>   |            |
|   | Rapid Deployment Pack, 10 Users, V1.x   | 269817-B21 |
|   | <p><b>NOTE:</b> This license allows 10 servers to be managed and deployed via the Deployment Server.</p> <p><b>NOTE:</b> Please see the following white paper to utilize Rapid Deployment on the Packaged Cluster:<br/> <a href="http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html">http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html</a></p> |            |

### Options (DL380 Generation 4 Packaged Cluster with MSA1000)

|  |            |
|--|------------|
| Rapid Deployment Pack, 10 Users, V1.x (Japan)<br><b>NOTE:</b> This license allows 10 servers to be managed and deployed via the Deployment Server.<br><b>NOTE:</b> Please see the following white paper to utilize Rapid Deployment on the Packaged Cluster:<br><a href="http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html">http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html</a>  | 269817-291 |
| ProLiant Essentials Integrated Lights-out advanced pack<br>(featuring: sophisticated virtual administration)   | 263825-B21 |
| Performance Management Pack, single server<br><b>NOTE:</b> This license allows 1 server to be managed by Performance Management Pack.  | 306696-B21 |
| Performance Management Pack, flexible license kit<br><b>NOTE:</b> A single pack is shipped with a single license key for the total number of licenses ordered  | 306697-B21 |
| ProLiant Essentials Virtual Machine Management Pack, Single-Server License<br><b>NOTE:</b> For use with a single server. Contains one license with a unique license activation key and documentation.  | 372214-B21 |
| ProLiant Essentials Virtual Machine Management Pack, Flexible-Quantity License<br><b>NOTE:</b> For use with multiple servers. This part number can be used to purchase multiple licenses with a single activation key.   | 372215-B21 |
| ProLiant Essentials Virtual Machine Management Pack, Tracking License<br><b>NOTE:</b> For use with signed and implemented Activation Key Agreements only. Purchase of this part number entitles the customer to deploy additional licenses of the product under the terms of the existing Activation Key Agreement.  | 372216-B21 |
| ProLiant Essentials Vulnerability and Patch Management Pack, Single-Server License   | 371645-B21 |
| ProLiant Essentials Vulnerability and Patch Management Pack, 10-Server License   | 372029-B21 |
| ProLiant Essentials Vulnerability and Patch Management Pack, Flexible-Quantity License   | 371646-B21 |
| ProLiant Essentials Vulnerability and Patch Management Pack, Tracking license for new servers  | 371647-B21 |
| ProLiant Essentials Vulnerability and Patch Management Pack, Tracking license for installed servers<br><b>NOTE:</b> Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to<br><a href="http://h18000.www1.hp.com/products/servers/proliantessentials/index.html">http://h18000.www1.hp.com/products/servers/proliantessentials/index.html</a><br>or the various ProLiant Essentials Value Pack product QuickSpecs for more information.<br><b>NOTE:</b> For more information regarding ProLiant Essentials Software, please see the following URL:<br><a href="http://h18000.www1.hp.com/products/servers/proliantessentials/index.html">http://h18000.www1.hp.com/products/servers/proliantessentials/index.html</a> | 378372-B21 |

### Options (DL380 Generation 4 Packaged Cluster with MSA1000)

|                       |  |            |
|-----------------------|--|------------|
| <b>Communications</b> | HP NC150T PCI 4-port Gigabit 1000T Combo Switch Adapter        | 367132-B21 |
|                       | HP NC310F PCI-X Single Port 1000SX Gigabit Server Adapter      | 368169-B21 |
|                       | HP NC320T PCI Express Single Port 1000T Gigabit Server Adapter | 367047-B21 |
|                       | HP NC1020 PCI Single Port 1000T Gigabit Server Adapter         | 353377-B21 |
|                       | HP NC6170 PCI-X Dual Port 1000SX Gigabit Server Adapter        | 313879-B21 |
|                       | HP NC7170 PCI-X Dual Port 1000T Gigabit Server Adapter         | 313881-B21 |
|                       | HP NC7771 PCI-X Single Port 1000T Gigabit Server Adapter       | 290563-B21 |

**NOTE:** Any network adapter (NIC), except the NC1020, on the option list can be used for redundancy with the embedded NC7782 NIC. When teaming with other NICs or with the embedded NIC, the lack of Jumbo Frames and LSO features on the NC1020 will cause high end NICs to have those features disabled. (e.g. incompatibility issues with the other option NICs for that platform).

|                          |  |            |
|--------------------------|--|------------|
| <b>Redundant Options</b> | Hot Plug AC Redundant Power Supply Module (NEMA cord) (NA) | 355892-001 |
|                          | Hot Plug AC Redundant Power Supply Module (IEC cord) (WW)  | 355892-B21 |

|                       |   |            |
|-----------------------|---|------------|
| <b>Optical Drives</b> | Slimline DVD-ROM                        | 264007-B21 |
|                       | Slimline CD-RW/DVD-ROM Combo Option Kit | 331903-B21 |
|                       | HP DVD+R/RW 8X Slim                     | 383974-B21 |

|                        |                         |            |
|------------------------|-------------------------|------------|
| <b>Diskette Drives</b> | Floppy Drive Option Kit | 364507-B21 |
|------------------------|-------------------------|------------|

|                    |  |            |
|--------------------|--|------------|
| <b>Hard Drives</b> | <b>Ultra320 SCSI - Universal Hot Plug</b>          |            |
|                    | 300-GB 10,000 rpm U320 Universal Hard Drive, 1"    | 350964-B22 |
|                    | 146.8-GB 10,000 rpm, U320 Universal Hard Drive, 1" | 286716-B22 |
|                    | 72.8-GB 10,000 rpm, U320 Universal Hard Drive, 1"  | 286714-B22 |
|                    | 146.8-GB Ultra320 SCSI 15,000 rpm Hard Drive, 1"   | 347708-B22 |
|                    | 72.8-GB 15,000 rpm, U320 Universal Hard Drive, 1"  | 286778-B22 |
|                    | 36.4-GB 15,000 rpm, U320 Universal Hard Drive, 1"  | 286776-B22 |

**NOTE:** All U320 Universal Hard Drives are backward compatible to U2 or U3 speeds. U320 drives require an optional U320 Smart Array Controller or U320 SCSI HBA to support U320 transfer rates.

**NOTE:** Please see the Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:

U320 Hard Drive QS:

[http://h18000.www1.hp.com/products/quickspecs/11531\\_div/11531\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11531_div/11531_div.HTML)  
(Worldwide)

[http://h18000.www1.hp.com/products/quickspecs/11531\\_na/11531\\_na.HTML](http://h18000.www1.hp.com/products/quickspecs/11531_na/11531_na.HTML)  
(North America)

### Options (DL380 Generation 4 Packaged Cluster with MSA1000)

|   |  |            |
|---|--|------------|
| <b>Modular Smart Array<br/>1000 Options</b> | MSA1000 High Availability Kit for Windows  | 353804-B21 |
|   | This convenient and affordable kit includes:   |            |
|   | - (1) MSA1000 Controller, with 256 MB cache  |            |
|   | - (1) MSA1000 SAN Switch 2/8   |            |
|   | - (2) FCA2214 Host Adapters (Linux & 32-bit Windows)   |            |
|   | - (1) Secure Path software, Windows (2 server/F200 kits)   |            |
|   | - (2) Fibre Channel cable, 5m  |            |
|   | MSA1000 High Availability Kit for Linux  | 353805-B21 |
|   | This convenient and affordable kit includes:   |            |
|   | - (1) MSA1000 Controller, with 256 MB cache  |            |
|   | - (1) MSA1000 SAN Switch 2/8   |            |
|   | - (2) FCA2214 Host Adapters (Linux & 32-bit Windows)   |            |
|   | - (1) Secure Path software, Linux (2 server/F200 kits)   |            |
|   | - (2) Fibre Channel cable, 5m  |            |
|   | MSA1000 Controller, with 256 MB cache  | 218231-B22 |
|   | MSA Fabric Switch 2/8  | 288247-B21 |
|   | FCA2214 Host Adapter (Linux & 32-bit Windows)  | 281541-B21 |
|   | 256-MB Cache Module for MSA1000 Controller   | 254786-B21 |
|   | <b>NOTE:</b> Optional storage memory allows the following configurations: 1 X 256 MB (standard), 2 X 256 MB.           |            |
|   | <b>NOTE:</b> When redundant controllers are installed, the cache configurations in both controllers must be identical. |            |
|   | HP StorageWorks Secure Path v4.0C for Windows Workgroup Edition  | 213076-B26 |
|   | HP StorageWorks Secure Path v3.0A for Linux Workgroup Edition  | 291536-B21 |
|   | ProLiant Cluster HA/F200 for MSA1000 for NT 4.0 and Windows 2000 (dual server, redundant path)                         | 252409-B23 |

### HP StorageWorks Secure Path Optional Software

Secure Path is a family of high availability multi-pathing software products providing continuous data access from the MSA1000 to ProLiant servers running the Windows Server 2003, Windows 2000, Windows NT, Linux and NetWare operating systems.

Redundant hardware, advanced RAID technology and Secure Path's automated failover capability are used to enhance fault tolerance and availability. Secure Path effectively eliminates controllers, disk drives, interconnect hardware and host bus adapters as single points of failure in the storage subsystem. The attachment of non-Secure Path (single HBA) servers to an MSA1000 with dual controllers that has servers with Secure Path (dual HBA) attached is supported where the operating systems are Windows or NetWare. Users must realize that in event of a controller fail-over (failure of active controller) the single path servers will lose access to their data on the MSA1000.

**NOTE:** If Secure Path for Linux is used on any node or cluster attached to an MSA1000, all nodes must also have Secure Path installed, regardless of operating systems.

**NOTE:** Refer to <http://www.hp.com/go/securepath> for the latest Secure Path parameters.

|                     |   |
|---------------------|---|
| <b>Key Features</b> | Maintains connections to storage                    |
|                     | Monitors I/O paths and alerts on significant events |
| <b>Used in</b>      | Stand alone Configurations                          |
|                     | Cluster configurations                              |
|                     | SAN configurations                                  |

### Options

|  |   |            |
|--|---|------------|
| <b>Secure Path v4.0B for Windows Workgroup Edition (including Windows Server 2003/32bit)</b>   | (Package includes separate programs for both the MSA1000 and the RA4000 and RA41000 solutions.)                                     |            |
|  | Secure Path v4.0B for Windows Workgroup one license   | 213076-B25 |
|  | Secure Path v4.0B for Windows Workgroup Edition five licenses   | 231316-B25 |
|  | Secure Path v4.0B for Windows Workgroup Edition 10 licenses   | 231317-B25 |
|  | Secure Path v4.0B for Windows Workgroup Edition 25 licenses   | 231318-B25 |
|  | Secure Path v4.0B for Windows Workgroup Edition 50 licenses   | 231319-B25 |
|  | Secure Path v4.0B for Windows Workgroup Edition Upgrade License   | 261715-B23 |
|  | Secure Path v4.0B for Windows Workgroup Edition for ProLiant BL line 8 licenses (MSA1000 support for -BL servers coming mid-summer) | 325634-B22 |
| <b>NOTE:</b> Refer to <a href="http://www.hp.com/go/securepath">http://www.hp.com/go/securepath</a> for the latest Secure Path parameters for NetWare. |   |            |

|  |  |            |
|--|--|------------|
| <b>Secure Path v3.0 for Linux Workgroup Edition</b>  | Secure Path v3.0 for Linux Workgroup Edition one license   | 291536-B21 |
|  | Secure Path v3.0 for Linux Workgroup Edition five licenses | 291537-B21 |
|  | Secure Path v3.0 for Linux Workgroup Edition 10 licenses   | 291538-B21 |
|  | Secure Path v3.0 for Linux Workgroup Edition 25 licenses   | 291539-B21 |
|  | Secure Path v3.0 for Linux Workgroup Edition 50 licenses   | 291540-B21 |
| <b>NOTE:</b> Refer to <a href="http://www.hp.com/go/securepath">http://www.hp.com/go/securepath</a> for the latest Secure Path parameters for NetWare. |  |            |

|                           |   |            |
|---------------------------|---|------------|
| <b>Management Options</b> | Remote Insight Lights-Out Edition II (NA, LA) | 227251-001 |
|                           | Remote Insight Lights-Out Edition II (EMEA)   | 227251-021 |
|                           | Remote Insight Lights-Out Edition II (ROW)    | 227251-371 |

|                 |   |            |
|-----------------|---|------------|
| <b>Security</b> | HP/Atalla AXL600L SSL Accelerator Card for ProLiant Servers | 524545-B21 |
|                 | AXL300 Accelerator PCI Card for ProLiant Servers            | 227933-B21 |

### Tape Drives

**NOTE:** For complete listing of tape drive offerings see <http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>

For recommended tape drive offerings for this ProLiant server see the following:

**NOTE:** External tape devices, including both tape drives and tape arrays/enclosures, can be directly connected to the VHDCI SCSI port located on the back of the server. Use of a SCSI adapter to connect these devices is optional, not required.

#### Hot Plug Tape Drives

|   |        |
|---|--------|
| HP StorageWorks DAT 40 Tape Drive, Internal Hot-Plug (Carbon) | Q1546A |
| HP StorageWorks DAT 72 Tape Drive, Internal Hot-Plug (Carbon) | Q1529A |

#### External, Rack-Mount and Array Module Ultrium Tape Drives

|   |        |
|---|--------|
| HP StorageWorks Ultrium 215 Tape Drive, External (Carbon)                                       | Q1545A |
| HP StorageWorks Ultrium 215 rack-mount (Carbon) - Single drive installed in a 1U rack-mount kit | A7444A |
| HP StorageWorks Ultrium 215 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300  | C7492B |

### Options

|  |            |
|--|------------|
| HP StorageWorks Ultrium 230 Tape Drive, External (Carbon)  | Q1517A     |
| HP StorageWorks Ultrium 230, Rack-mount (Carbon) - Single drive installed in a 3U rack-mount kit | 350545-B21 |
| HP StorageWorks Ultrium 230 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300   | C7470B     |
| HP StorageWorks Ultrium 448 Tape Drive, External (Carbon)  | DW017A     |
| HP StorageWorks Ultrium 448 rack-mount (Carbon) - Single drive installed in a 3U rack-mount kit  | DW028A     |
| HP StorageWorks Ultrium 448 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300   | DW019A     |
| HP StorageWorks Ultrium 460 Tape Drive, External (Carbon)  | Q1520A     |
| HP StorageWorks Ultrium 460, Rack-mount (Carbon) - Single drive installed in a 3U rack-mount kit | 350546-B21 |
| HP StorageWorks Ultrium 460 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300   | Q1512B     |
| HP StorageWorks Ultrium 960 Tape Drive, External (Carbon)  | Q1539A     |
| HP StorageWorks Ultrium 960, Rack-mount (Carbon) - Single drive installed in a 3U rack-mount kit | Q1595A     |
| HP StorageWorks Ultrium 960 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300   | Q1540A     |

**NOTE:** Please see the HP StorageWorks Ultrium 215, 230, and 460 Tape Drive QuickSpecs for additional options such as controllers, media, and other related items:

[http://h18006.www1.hp.com/products/quickspecs/11739\\_div/11739\\_div.html](http://h18006.www1.hp.com/products/quickspecs/11739_div/11739_div.html)  
(Worldwide)

[http://h18006.www1.hp.com/products/quickspecs/11739\\_na/11739\\_na.html](http://h18006.www1.hp.com/products/quickspecs/11739_na/11739_na.html)  
(North America)

[http://h18006.www1.hp.com/products/quickspecs/12128\\_div/12128\\_div.html](http://h18006.www1.hp.com/products/quickspecs/12128_div/12128_div.html)  
(Worldwide)

[http://h18006.www1.hp.com/products/quickspecs/12128\\_na/12128\\_na.html](http://h18006.www1.hp.com/products/quickspecs/12128_na/12128_na.html)  
(North America)

For an up-to-date listing of the latest O/S and software support details for HP Ultrium tape drives, please visit: <http://www.hp.com/go/connect>

#### **External, Hot-Plug, and Array Module DAT Drives**

|  |        |
|--|--------|
| HP StorageWorks DAT 72 Tape Drive, External (Carbon)                                       | Q1523A |
| HP StorageWorks DAT 72 Tape Drive, Internal Hot-Plug (Carbon)                              | Q1529A |
| HP StorageWorks DAT 72 rack-mount (Carbon) - Single drive installed in a 1U rack-mount kit | A7443A |
| HP StorageWorks DAT 72 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300  | Q1524B |
| HP StorageWorks DAT 40 Tape Drive, External (Carbon)                                       | C5687C |
| HP StorageWorks DAT 40 Tape Drive, Internal Hot-Plug (Carbon)                              | Q1546A |
| HP StorageWorks DAT 40 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300  | C7497B |

### Options

**NOTE:** Please see the DAT Tape Drive QuickSpecs for controllers, media, and other options:

[http://h18000.www1.hp.com/products/quickspecs/11883\\_div/11883\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11883_div/11883_div.HTML)  
(Worldwide)

[http://h18000.www1.hp.com/products/quickspecs/11883\\_na/11883\\_na.HTML](http://h18000.www1.hp.com/products/quickspecs/11883_na/11883_na.HTML)  
(North America)

For an up-to-date listing of the latest O/S and software support details for HP DAT drives, please visit: <http://www.hp.com/go/connect>

#### **Rack-Mount Tape Drive Enclosures**

HP StorageWorks 1U Rack-Mount Kit A7445A

**NOTE:** The 1U Rack-mount Kit can support up to 2 half-height tape drives and compatible with multiple Single-Ended and LVD SCSI tape drives including DAT 24, DAT40, DAT72, DLT VS 80, DLT VS 160, Ultrium 215 and Ultrium 448 tape drives.

HP StorageWorks 3U Rack-Mount Kit 274338-B21

**NOTE:** The 3U Rack-Mount Kit can support up to 2 full-height or 4 half-height tape drives and compatible with multiple Single-Ended and LVD SCSI tape drives including DAT, DLT VS80, DLT VS160, SDLT 320, SDLT 600, Ultrium 215, Ultrium 230, Ultrium 448, Ultrium 460 and Ultrium 960 Tape Drives.

HP StorageWorks 5U Rack-Mount Kit 274339-B21

**NOTE:** The 5U Rack-Mount Kit can support up to 4 full-height tape drives and is compatible with SDLT 320, SDLT 600, Ultrium 230, Ultrium 460 and Ultrium 960 tape drives.

**NOTE:** Please see the Rack-Mount Tape Drive Kits QuickSpecs for additional information regarding these kits:

[http://h18000.www1.hp.com/products/quickspecs/10854\\_div/10854\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/10854_div/10854_div.HTML)  
(Worldwide)

[http://h18000.www1.hp.com/products/quickspecs/10854\\_na/10854\\_na.HTML](http://h18000.www1.hp.com/products/quickspecs/10854_na/10854_na.HTML)  
(North America)

HP StorageWorks Tape Array 5300 C7508A

**NOTE:** The Tape Array 5300 is a 3U enclosure that supports up to 2 full-height or 4 half-height hot-swap array modules, including DAT and Ultrium tape drives. Cables and terminators are not included and must be ordered separately.

**NOTE:** Please see the Tape Array 5300 QuickSpecs for additional information regarding this product.

[http://h18000.www1.hp.com/products/quickspecs/11878\\_div/11878\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/11878_div/11878_div.HTML)  
(Worldwide)

[http://h18000.www1.hp.com/products/quickspecs/11878\\_na/11878\\_na.HTML](http://h18000.www1.hp.com/products/quickspecs/11878_na/11878_na.HTML)  
(North America)

#### **Accessories for 3U & 5U Rack-mount Tape Drive Kits**

LVD Cable Kit, VHDCI/HD68 168048-B21

**NOTE:** For use with the 3U Rack-mount Kit and 5U Rack-mount Kit only.

LVD Cable Kit, HD68/HD68 242381-B21

**NOTE:** For use with the 3U Rack-mount Kit and 5U Rack-mount Kit only.

#### **Accessories for 3U & 5U Rack-mount Tape Drive Kits**

*PSU/Fan Upgrade Kit - Redundant hot-swap power supply unit and fan for Tape Array 5300.*

68-pin HD multi-mode terminator C2364A

1.0m 68-pin VHDCI to 68-pin HD cable C2361B

2.5m 68-pin VHDCI to 68-pin HD cable C2362B

5.0m 68-pin VHDCI to 68-pin HD cable C2365A

### Options

|  |        |
|--|--------|
| 10.0m 68-pin VHDCI to 68-pin HD cable          | C2363B |
| 0.5m 68-pin HDI to 68-pin HD cable LVD/SE      | C2978B |
| 1.5m 68-pin HDI to 68-pin HD cable LVD/SE      | C2979B |
| 0.9m 68-pin HDI to 68-pin HD cable LVD/SE      | C2911C |
| 2.5m 68-pin HDI to 68-pin HD cable LVD/SE      | C2924C |
| <b>NOTE:</b> For use with Tape Array 5300 only |        |

### Tape Autoloaders

#### DAT Autoloader

HP StorageWorks DAT 72x6 Tape Autoloader, External (Carbon) Q1567A

**NOTE:** Please see the [DAT Tape Autoloader QuickSpecs](http://www.hp.com/go/tape) at <http://www.hp.com/go/tape> for additional options such as host bus adapters, controllers and media.

#### HP StorageWorks 1/8 Tape Autoloader

1/8 Ultrium 460 Tape Autoloader, Tabletop AA927A

1/8 SDLT 320 Tape Autoloader, Tabletop AA926A

1/8 Ultrium 230 Tape Autoloader, Tabletop C9572CB

1/8 DLT VS80 Tape Autoloader, Tabletop C9264CB

1/8 Tape Autoloader Rack-mount Kit C9268R

**NOTE:** Required to install the 1/8 tape autoloader in a standard 19-inch rack

**NOTE:** Please reference the [1/8 Tape Autoloader QuickSpecs](http://www.hp.com/go/automation) at <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at <http://www.hp.com/go/ebs>

#### HP StorageWorks SSL1016 Tape Autoloader

SSL1016 Ultrium 460 Tape Autoloader 330821-B21

SSL1016 SDLT 320 Tape Autoloader 330816-B21

**NOTE:** Please reference the [SSL1016 Tape Autoloader QuickSpecs](http://www.hp.com/go/automation) at <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at <http://www.hp.com/go/ebs>.

### External Storage

HP StorageWorks Modular Smart Array 30 SB 302969-B21

HP StorageWorks Modular Smart Array 30 DB 302970-B21

Ultra320 Dual Bus I/O Module for MSA30 287483-B21

Ultra320 Single Bus I/O Module for MSA30 287484-B21

### Options

|                 |  |            |
|-----------------|--|------------|
| Cluster Options | HP Serviceguard for Linux ProLiant Cluster A.11.15 for SUSE SLES 8 (2 node license cluster kit).                       | 305199-B24 |
|                 | HP Serviceguard for Linux ProLiant Cluster A.11.16 for SUSE SLES 9 and Red Hat EL 3 and 4 (2 node license cluster kit) | 305199-B25 |
|                 | HP Serviceguard for Linux License A.11.15 for SUSE SLES 8 / UnitedLinux 1.0 (single license version)                   | 307754-B24 |
|                 | HP Serviceguard for Linux A.11.16 for SUSE SLES9 and Red Hat EL 3 and 4 (single license version)                       | 307754-B25 |

**NOTE:** For additional information regarding the HP Serviceguard for Linux ProLiant Cluster, please see the following QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/11518\\_na/11518\\_na.html](http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html)  
(North America)

[http://h18000.www1.hp.com/products/quickspecs/11518\\_div/11518\\_div.html](http://h18000.www1.hp.com/products/quickspecs/11518_div/11518_div.html)  
(Worldwide)

|                               |  |
|-------------------------------|--|
| UPS and PDU Power Cord Matrix | <i>Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units:</i><br><a href="ftp://ftp.compaq.com/pub/products/servers/ProLiantstorage/power-protection/powercordmatrix.pdf">ftp://ftp.compaq.com/pub/products/servers/ProLiantstorage/power-protection/powercordmatrix.pdf</a> . |
|-------------------------------|--|

|  |   |            |
|--|---|------------|
| Uninterruptible Power Systems – Rack Mountable | UPS R1500 XR (1440VA, 1340 Watt), Low Voltage (NA)                        | 204404-001 |
|  | UPS R1500 XR (1500VA, 1340 Watt), High Voltage (Int'l)                    | 204404-B31 |
|  | UPS R1500 XR (1500VA, 1340 Watt), Low Voltage (Japan)                     | 204404-291 |
|  | UPS R3000 XR (2880VA, 2700 Watt), Low Voltage (NA)                        | 192186-001 |
|  | UPS R3000 XR (3000VA, 2700 Watt), High Voltage (NA)                       | 192186-002 |
|  | UPS R3000 XR (2400VA, 2250 Watt), Low Voltage (Japan)                     | 192186-291 |
|  | UPS R3000 XR (3000VA, 2700 Watt), High Voltage (Japan)                    | 192186-292 |
|  | UPS R3000 XR (3000VA, 2700 Watt), High Voltage (Int'l - detachable cord)  | 192186-B31 |
|  | UPS R3000 XR (3000VA, 2700 Watt), High Voltage (1 6A IEC309 Plug)         | 192186-B32 |
|  | UPS R3000 XR (3000VA, 2700 Watt), High Voltage (1 6A CEE 7/7 SCHUKO Plug) | 192186-B33 |
|  | UPS R3000 XR (3000VA, 2700 Watt), High Voltage (1 6A BS-546 Plug)         | 192186-AR1 |
|  | HP UPS R5500 XR (5000VA, 4500 Watt), High Voltage (NA/JPN)                | 326529-D71 |
|  | HP UPS R5500 XR (6000VA, 5400 Watt), High Voltage (Int'l)                 | 326529-B31 |
|  | UPS R12000 XR N+x (200-240V) (WW-hardwired)                               | 207552-B22 |

**NOTE:** The UPS R12000 XR has a hardwired input and output; requires a 100A circuit.

### Options

|  |  |            |
|--|--|------------|
| HP Power Distribution Unit with Power Monitoring | HP Power Distribution Unit with Power Monitoring Model S2324 - dual input, 3 phase, 24A (NA/JPN)   | 370959-D71 |
|  | HP Power Distribution Unit with Power Monitoring Model S1324 - single input, 3 phase, 24A (NA/JPN) | 370960-D71 |
|  | HP Power Distribution Unit with Power Monitoring Model S2140 - dual input, 1 phase, 40A (NA/JPN)   | 370961-D71 |
|  | HP Power Distribution Unit with Power Monitoring Model S1140 - single input, 1 phase, 40A (NA/JPN) | 370962-D71 |
|  | HP Power Distribution Unit with Power Monitoring Model S2316 - dual input, 3 phase, 16A (INTL)     | 370963-B31 |
|  | HP Power Distribution Unit with Power Monitoring Model S1316 - single input, 3 phase, 16A (INTL)   | 370964-B31 |
|  | HP Power Distribution Unit with Power Monitoring Model S2132 - dual input, 1 phase, 32A (INTL)     | 370965-B31 |
|  | HP Power Distribution Unit with Power Monitoring Model S1132 - single input, 1 phase, 32A (INTL)   | 370966-B31 |

|  |   |            |
|--|---|------------|
| Modular PDUs 1U/0U<br>(Up to 32 outlets)<br><b>NOTE:</b> 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).  | HP Modular Power Distribution Units (mPDU), Low Volt Model, 24A (100-127 VAC) (NA, Japan)               | 252663-D71 |
|  | <b>NOTE:</b> This mPDU (252663-D71) may also be used to connect the low volt model of the UPS R3000 XR. |            |
|  | HP Modular Power Distribution Units (mPDU), High Volt Model, 24A (200-240 VAC) (NA, Japan)              | 252663-D72 |
|  | HP Modular Power Distribution Units (mPDU), High Volt Model, 32A (200-240 VAC) (Int'l)                  | 252663-B31 |
|  | HP Modular Power Distribution Units (mPDU), High Volt Model, 40A (200-240 VAC) (WW)                     | 252663-B21 |
|  | <b>NOTE:</b> This mPDU (252663-B21), 40A model has a hardwired input.                                   |            |
|  | HP Modular Power Distribution Unit (mPDU), High Volt Model, 40A (200-240 VAC) (NA/JPN)                  | 252663-D73 |
|  | <b>NOTE:</b> This 40A mPDU's (252663-D73) has attached power cords.                                     |            |
| HP Modular Power Distribution Unit (mPDU), High Volt Model, 40A (200-240 VAC) (INTL)   | 252663-B32  |            |
| <b>NOTE:</b> This 40A mPDU's (252663-B32) has attached power cords.  |   |            |
| HP Modular Power Distribution Units (mPDU), High Volt Model, 16A (200-240 VAC) (WW)  | 252663-B24  |            |
| <b>NOTE:</b> This PDU has a detachable input power cord and allows for adaptability to country specific power requirements. This model may also be used with the high volt UPSs R3000 XR and R6000. For North America, need to order cable PN 340653-001.  |   |            |
| <b>NOTE:</b> Please see the following Modular Power Distribution Unit (Zero-U/1U Modular PDUs) QuickSpecs for additional options including shorter jumper cables and country specific power cords:<br><a href="http://h18000.www1.hp.com/products/quickspecs/11041_na/11041_na.HTML">http://h18000.www1.hp.com/products/quickspecs/11041_na/11041_na.HTML</a><br>(North America)<br><a href="http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.HTML">http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.HTML</a><br>(Worldwide) |   |            |

### Options

USB Options                      USB Easy Access Keyboard (carbon)                      267146-xx8

**USB Easy Access Keyboard (Carbon) Country Key Code**

| Dash # | Description     | Dash # | Description |
|--------|-----------------|--------|-------------|
| -008   | US              | -178   | Arabic      |
| -038   | UK              | -188   | Belgium     |
| -048   | Germany         | -218   | Hungary     |
| -058   | France          | -228   | Czech       |
| -068   | Italy           | -238   | Slovak      |
| -078   | Spain           | -245   | Polish      |
| -088   | Denmark         | -258   | Russian     |
| -098   | Norway          | -298   | Japan       |
| -108   | Sweden/Finland  | -338   | Dutch       |
| -128   | French Canadian | -358   | Finish      |
| -138   | Portugal        | -B38   | Int'l       |
| -148   | Turkey          | -B48   | BHCSY       |
| -155   | Greek           |        |             |

USB Easy Access Keyboard (carbonite)                      DC168B#

256MB HP Drive Key II (USB 2.0)                      PH657A

USB 2-Button Scroll Mouse (carbon)                      195255-B25

USB 2-Button Scroll Mouse (carbonite)                      DD441B

USB Floppy (carbonite)                      DC141B

**USB Easy Access Keyboard (Carbonite) Country Key Code**

| Dash # | Description | Dash # | Description |
|--------|-------------|--------|-------------|
| A2M    | ICELAND     | ABT    | HE          |
| AB0    | TAWA        | ABU    | UK          |
| AB1    | KOR         | ABV    | ARA         |
| AB2    | PRC         | ABX    | FIN         |
| AB6    | FRA         | ABY    | DEN         |
| AB7    | GRK         | ABZ    | ITL         |
| AB8    | TURK        | AC0    | BEL         |
| AB9    | PORT        | AC4    | BRZ         |
| ABA    | US          | ACB    | RUSS        |
| ABB    | EURO        | AKB    | CZE         |
| ABC    | FCAN        | AKC    | HUNG        |
| ABD    | GR          | AKD    | POL         |
| ABE    | SP          | AKL    | THAI        |
| ABF    | FR          | AKN    | BHCSY       |
| ABH    | NL          | AKR    | SLOV        |
| ABJ    | Japan       | ARK    | ICELAND     |
| ABM    | LA          | B15    | KAZ         |
| ABN    | NOR         | UUZ    | SWISS       |

### Options

ABS

SW

#### Custom Builder

Please see the Enterprise Configurator for configuration assistance at:  
<http://www.hp.com/products/configurator>

#### HP Rack 5000 Series (Graphite Metallic)

HP 5642 Rack-Unassembled

358254-B21

#### Rack Options for Rack 5000 Series

Stabilizer Kit for 5642 Rack (Graphite Carbon)

**NOTE:** The stabilizing kit is used to prevent rack from tipping over.

374493-B21

Baying Kit for 5642 Rack (Graphite Carbon)

**NOTE:** The baying kit is used to join two or more HP 5642 racks.

374499-B21

#### HP Rack 10000 Series (Graphite Metallic)

10642 (42U) Infrastructure Rack (Low Voltage)

379006-001

10642 (42U) Infrastructure Rack (High Voltage)

379005-001

HP Rack S10614 (14U) Rack Cabinet - Shock Pallet

292302-B22

HP Rack 10842 (42U, 800mm wide) – Pallet

257415-B21

HP Rack 10842 (42U, 800mm wide) – Shock Pallet

257415-B22

HP Rack 10647 (47U) – Pallet

245160-B21

HP Rack 10647 (47U) – Crated

245160-B23

HP Rack 10642 (42U) – Pallet

245161-B21

HP Rack 10642 (42U) – Shock Pallet

245161-B22

HP Rack 10642 (42U) – Crated

245161-B23

HP Rack 10636 (36U) – Pallet

245162-B21

HP Rack 10636 (36U) – Shock Pallet

245162-B22

HP Rack 10636 (36U) – Crated

245162-B23

HP Rack 10622 (22U) – Pallet

245163-B21

HP Rack 10622 (22U) – Shock Pallet

245163-B22

HP Rack 10622 (22U) – Crated

245163-B23

**NOTE:** -B21 (pallet) used to ship empty racks shipped on a truck

-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels)

-B23 (crated) used for air shipments of empty racks

**NOTE:** It is mandatory to use a shock pallet in order to ship racks with equipment installed. Not all Compaq equipment is qualified to be shipped in the Rack 10000 series.

**NOTE:** Please see the Rack 10000 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color:

[http://h18000.www1.hp.com/products/quickspecs/10995\\_div/10995\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/10995_div/10995_div.HTML)  
(Worldwide)

[http://h18000.www1.hp.com/products/quickspecs/10995\\_na/10995\\_na.HTML](http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.HTML)  
(North America)

**NOTE:** For additional information regarding Rack Cabinets, please see the following URL:

<http://h18000.www1.hp.com/products/servers/proliantstorage/racks/index.html>.

### Options

#### Rack Options for HP Rack 10000 Series

**NOTE:** For additional information regarding Rack Options, please see the following URL:

<http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html>

|                                    |            |
|------------------------------------|------------|
| HP Rack Light Kit (Neon)           | 361589-B21 |
| HP Rack Plinth Kit (Carbon)        | 251960-B21 |
| 42U Side Panel – Graphite Metallic | 246099-B21 |
| 36U Side Panel – Graphite Metallic | 246102-B21 |
| 47U Side Panel – Graphite Metallic | 255486-B21 |
| TFT5600 Rack Keyboard Monitor      | 221546-xx1 |
| TFT7210R Rack Mounted 17" Monitor  | 348373-B21 |

**NOTE:** For a complete list of Monitors please view the following URL:

<http://h18004.www1.hp.com/products/monitors/>

|                                    |            |
|------------------------------------|------------|
| 1U Rack Keyboard & Drawer (Carbon) | 257054-xx1 |
|------------------------------------|------------|

**NOTE:** The 1U Rack Keyboard & Drawer (PN 257054-xx1) is to be used with the Keyboards for Racks with Trackball (PN 158649-xxx).

**Country Code Key** (for 1U Rack Keyboard & Drawer (PN 257054-xx1))

|          |         |          |                |
|----------|---------|----------|----------------|
| XX = 001 | US      | XX = 091 | Norway         |
| XX = 031 | UK      | XX = 101 | Sweden/Finland |
| XX = 041 | Germany | XX = 111 | Switzerland    |
| XX = 051 | France  | XX = 131 | Portugal       |
| XX = 061 | Italy   | XX = 181 | Belgium        |
| XX = 071 | Spain   | XX = 291 | Japan          |
| XX = 081 | Denmark | XX = B31 | International  |

**NOTE:** For additional information regarding Rack Options, please see the following URL: <http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html>.

#### HP KVM Switch Options

|   |            |
|---|------------|
| Server Console Switch (KVM), 0 x 1 x 8 port         | 336044-B21 |
| Server Console Switch (KVM), 0 x 2 x 16 port        | 336045-B21 |
| IP Console Switch Box (KVM/IP), 1 x 1 x 16          | 262585-B21 |
| IP Console Switch Box (KVM/IP), 3 x 1 x 16          | 262586-B21 |
| HP 1x4 USB/PS2 KVM Switch, RM (ALL)                 | 371302-B21 |
| HP 1x4 USB/PS2 KVM Switch, TT (EURO)                | 371301-A21 |
| HP 1x4 USB/PS2 KVM Switch, TT (UK)                  | 371301-031 |
| HP 1x4 USB/PS2 KVM Switch, TT (AUST/NZ)             | 371301-011 |
| HP 1x4 USB/PS2 KVM Switch, TT (NA/JPN)              | 371301-D71 |
| PS/2 Interface Adapter, 8 pack                      | 262587-B21 |
| PS/2 Interface Adapter, 1 pack                      | 262588-B21 |
| CAT5 KVM Expansion Module                           | 262589-B21 |
| Serial Interface adapter - 1 Pack with power supply | 373035-B21 |
| CAT5e Cable 3', 4 pack                              | 263474-B21 |
| CAT5e Cable 6', 8 pack                              | 263474-B22 |

### Options

|                         |            |
|-------------------------|------------|
| CAT5e Cable 12', 8 pack | 263474-B23 |
| CAT5e Cable 20', 4 pack | 263474-B24 |
| CAT5e Cable 40', 1 pack | 263474-B25 |

NOTE: For additional information regarding HP KVM Switches and options, please see the following URL:

<http://h18004.www1.hp.com/products/servers/proliantstorage/rack-options/list.html#console>

|  |   |            |
|--|---|------------|
| Rack Options for Third Party Cabinet Racks | Input Device Telco Rails  | 287138-B21 |
|  | NOTE: Input Device Telco Rails (287138-B21) are for use ONLY with the TFT5110R, TFT5600RKM and integrated keyboard/drawer which is used in mounting into third party racks. |            |
|  | Round hole rack cabinet rail kit  | 293052-B21 |
|  | NOTE: Support for racks with round mounting holes (include HP Rack System /E and HP Systems) with an adjustment range of 24"- 36".  |            |

### Service and Support Offerings (HP Care Pack Services)

NOTE: The DL380 Packaged Cluster Care Pack services cover the two DL380 servers and the external storage component.

#### Hardware Services 4-Hour On-site Service

|   |        |
|---|--------|
| 4-Hour On-site Service, 13-Hour x 5-Day Coverage, 3 Years             | U4560A |
| 4-Hour On-site Service, 13-Hour x 5-Day Coverage, 3 Years, Electronic | U4560E |
| 4-Hour On-site Service, 24-Hour x 7-Day Coverage, 3 Years             | U4561A |
| 4-Hour On-site Service, 24-Hour x 7-Day Coverage, 3 Years, Electronic | U4561E |
| 24-Hour x 7-Day, 6-hour Call To Repair, 3 Years                       | U4562A |
| 24-Hour x 7-Day, 6-hour Call To Repair, 3 Years, Electronic           | U4562E |

#### Installation & Start-up Services

|  |        |
|--|--------|
| Hardware Installation  | U4570A |
| Hardware Installation, Electronic  | U4570E |
| Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays.            | U2870A |
| Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays, Electronic | U2870E |

#### W2K AS Cluster Configuration HP Care Pack

|  |        |
|--|--------|
| Install & Configure MS Windows 2000 Advanced Sever Cluster software on a cluster             | U5701A |
| Install & Configure MS Windows 2000 Advanced Sever Cluster software on a cluster, Electronic | U5701E |

#### Support Plus

|  |        |
|--|--------|
| Onsite HW support, 8am-9pm, M-F, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays.            | U4571A |
| Onsite HW support, 8am-9pm, M-F, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays, Electronic | U4571E |

### Options

#### **Support Plus 24**

Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays.

U4572A

Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic

U4572E

**NOTE:** For more information, customer/resellers can contact

<http://www.hp.com/hps/>

### Memory

#### HP ProLiant DL380 G4 Packaged Cluster with Modular Smart Array 1000

##### Standard Memory

1 GB PC2 PC3200 DDR2 SDRAM running at 400MHz comes installed (2 x 512-MB SDRAM)

##### Standard Memory Plus Optional Memory

Up to 5,120-MB memory is available with the optional installation of PC2 PC3200 DDR2 SDRAM running at 400MHz memory kits.

##### Standard Memory Replaced with Optional Memory

Up to 6,144-MB memory is available with the removal of the standard 1-GB of memory and the optional installation PC2 PC3200 DDR2 SDRAM running at 400MHz memory option kits.

**NOTE:** Chart does not represent all possible configurations.

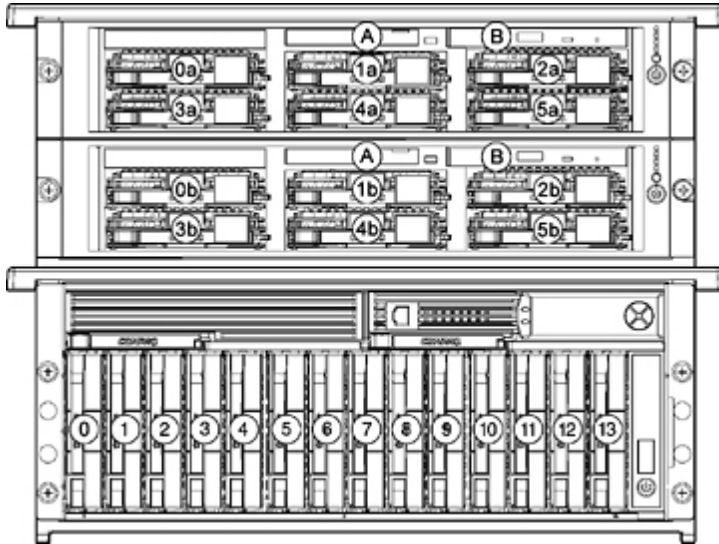
| Memory   |          | Slot   |        |         |         |         |         |
|----------|----------|--------|--------|---------|---------|---------|---------|
|          |          | 1      | 2      | 3       | 4       | 5       | 6       |
| Standard | 1,024 MB | 512 MB | 512 MB | Empty   | Empty   | Empty   | empty   |
| Optional | 5,120 MB | 512 MB | 512 MB | 1024 MB | 1024 MB | 1024 MB | 1024 MB |
| Maximum  | 12 GB    | 2GB    | 2GB    | 2GB     | 2GB     | 2GB     | 2GB     |

**NOTE:** Slots 3 and 6 can be configured as online spare memory through RBSU.

Following are memory options available from HP:

- 1GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2 x 512 MB) 343055-B21
- 2GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2x1024 MB) 343056-B21
- 4GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2x 2048 MB) 343057-B21

### Storage



- 0a - 5a Six 1" Wide Ultra320 SCSI hot plug hard drive bays
- 0b-5b Six 1" Wide Ultra320 SCSI hot plug hard drive bays
- 0-13 Fourteen 1" Wide Ultra320 SCSI hot plug drive bays
- A Optional 1.44-MB Diskette Drive
- B 24x IDE CD-ROM (Slimline)  
**NOTE: Only a CD-ROM drive is qualified for use in the MultiBay slot.**
- 0a & 0b Convertible 1.6" drive bay - supports either (1) 1" Hot Plug Drive or (1) 1.6" AIT or 20/40/100-GB DAT Hot Plug Tape Drive from 1-13)

### Drive Support

|                        | Quantity Supported | Position Supported | Controller     |
|------------------------|--------------------|--------------------|----------------|
| 1.44-MB Diskette Drive | Up to 1            | a                  | Integrated     |
| IDE CD-ROM Drive       | Up to 1            | b                  | Integrated IDE |

### Hard Drives

#### Ultra320 Hot Pluggable Drives

|                     | Quantity Supported | Position Supported | Controller  |
|---------------------|--------------------|--------------------|---|
| <u>1-inch</u>       |                    |                    |   |
| 300-GB 10,000 rpm   | Up to 26           | 0a-5a, 0b-5b,      | Smart Array 6i Controller (integrated on system board)<br>64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter<br>64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS |
| 146.8-GB 10,000 rpm |                    | 0-13               |   |
| 72.8-GB 10,000 rpm  |                    |                    |   |
| 146.8-GB 15,000 rpm |                    |                    |   |
| 72.8-GB 15,000 rpm  |                    |                    |   |
| 36.4-GB 15,000 rpm  |                    |                    |   |

**NOTE:** All U320 Universal Hard Drives are backward compatible to U2 or U3 speeds. U320 drives require an optional U320 Smart Array Controller or U320 SCSI HBA to support U320 transfer rates.

#### Maximum Storage Capacity – (ProLiant DL380 G4, per server)

|          |                                 |
|----------|---------------------------------|
| Internal | 1.8 TB (6 x 300 GB Ultra320 1") |
| Total    | 1.8 TB                          |

### Storage

#### Maximum Shared Storage Capacity (Modular Smart Array 1000)

Internal 4.2 TB (14 x 300 GB Ultra320 1")

With one MSA30 disk enclosure 8.4 TB (28 x 300 GB Ultra320 1")

With two MSA30 disk enclosures 12.6 TB (42 x 300 GB Ultra320 1")

**NOTE:** Additional MSA30 disk enclosures must be purchased separately and not fit into the 8U Packaged Cluster fixture. MSA30 disk enclosures must be installed in an HP rack with the DL380 Packaged Cluster with MSA1000. MSA30 disk enclosures may be purchased as tower models, as well.

### Tape Drives and Tape Autoloaders

**NOTE:** For an up-to-date listing of the latest O/S Support details for each of the Tape Drives listed below, please see the following:  
[http://h18000.www1.hp.com/products/quickspecs/North\\_America/10233.html](http://h18000.www1.hp.com/products/quickspecs/North_America/10233.html) (North America)

<http://h18000.www1.hp.com/products/quickspecs/Division/10233.html> (Worldwide)

**NOTE:** For an up-to-date listing of the latest O/S Support details for each of the Tape Autoloaders listed below, please see the following:

[http://h18000.www1.hp.com/products/quickspecs/North\\_America/10809.html](http://h18000.www1.hp.com/products/quickspecs/North_America/10809.html) (North America)

<http://h18000.www1.hp.com/products/quickspecs/Division/10809.html> (Worldwide)

**NOTE:** For complete listing of tape drive offerings see

<http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>

For recommended tape drive offerings for this ProLiant server see the following:

|   | Quantity Supported | Position Supported | Controller  |
|---|--------------------|--------------------|---|
| <b>HP StorageWorks Tape Drives, Internal Hot Plug</b><br>DAT 40 Tape Drive<br>DAT 72 Tape Drive   | 1 (per server)     | 0a, 0b             | Smart Array 5i Controller (integrated on system board)  |
| <b>HP StorageWorks Tape Drives, External</b><br>Ultrium 215, External<br>Ultrium 230, External<br>Ultrium 448, External<br>Ultrium 460, External                                  | Up to 2            | External           | 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2<br>64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter<br>64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS |
| <b>HP StorageWorks Tape Drives, External</b><br>Ultrium 960, External   | 1                  | External           | 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2<br>64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter  |
| <b>HP StorageWorks Tape Drives, External</b><br>DAT 72 Tape Drive<br>DAT 40 Tape Drive<br>DAT 24 Tape Drive<br>DLT VS80 Tape Drive<br>DLT VS160 Tape Drive<br>SDLT 320 Tape Drive | Up to 2            | External           | 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2<br>64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter<br>64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS |

### Storage

|  |                    |          |   |
|--|--------------------|----------|---|
| <b>HP StorageWorks Rack-mount Tape Drive Enclosures</b><br>1U Rack-Mount Kit<br>3U Rack-Mount Kit<br>5U Rack-Mount Kit     | 1 per SCSI channel | External | 64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter<br>64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS |
| <b>HP StorageWorks Autoloaders, External</b><br>DAT 72x6 Tape Autoloader<br>1/8 Tape Autoloader<br>SSL1016 Tape Autoloader | 1                  | External | 64-Bit/133Mhz Dual Channel Ultra320 SCSI Adapter<br>64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS |

### Power Specifications

|  |                  |
|--|------------------|
| Part Number                            | 194989-001       |
| Spare Kit                              | 19982-B21        |
| Operational Input Voltage Range (Vrms) | 90 to 264        |
| Frequency Range (Nominal) (Hz)         | 47 to 63 (50/60) |

| Nominal Input Voltage (Vrms)           | 100  | 115  | 208  | 220  | 230  | 240  |
|--|------|------|------|------|------|------|
| Max Rated Output Wattage Rating        | 400  | 400  | 400  | 400  | 400  | 400  |
| Nominal Input Current (Arms)           | 5.8  | 5.0  | 2.7  | 2.5  | 2.4  | 2.3  |
| Max Rated Input Wattage Rating (Watts) | 571  | 563  | 548  | 541  | 541  | 541  |
| Max. Rated VA (Volt-Amp)               | 583  | 575  | 559  | 552  | 552  | 552  |
| Efficiency (%)                         | 70   | 71   | 73   | 74   | 74   | 74   |
| Power Factor                           | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Leakage Current (mA)                   | 0.31 | 0.36 | 0.65 | 0.69 | 0.72 | 0.75 |
| Maximum Inrush Current (A peak)        | 50   | 50   | 50   | 50   | 50   | 50   |
| Maximum Inrush Current duration        | 20   | 20   | 20   | 20   | 20   | 20   |

#### NOTES:

\* To review typical system power ratings use the Active Answers Power Calculator which is available via the online tool located at URL: <http://h30099.www3.hp.com/configurator/powercalcs.asp>.

To drill down to calculators:

- Click on: "ProLiant Servers"
- Click on the Server of interest. Example: DL380 G4 Packaged Cluster
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

| Power Cords (13 Cord Sets) |                        |
|----------------------------|------------------------|
| Country                    | Power Cord Part Number |
| APD                        | 139867-006             |
| APD                        | 100613-003             |
| APD                        | 100614-003             |
| Australia                  | 100611-007             |
| Europe                     | 100614-003             |
| France                     | 100614-003             |
| Germany                    | 100614-003             |
| Japan                      | 139867-006             |
| PRC                        | 139867-006             |
| PRC                        | 100613-003             |
| PRC                        | 100661-007             |
| UK                         | 100613-003             |
| US                         | 163719-002             |

### Modular Smart Array Cluster Storage Power Specification

### Power Specifications

| Nominal Input Voltage (Vrms)                                     | 100V 60 Hz | 120V 60 Hz | 208 60 Hz | 220V 50 Hz | 240V 50 Hz |
|--|------------|------------|-----------|------------|------------|
| Nominal Input Current(Vrms)                                      | 4.50       | 3.69       | 2.08      | 1.97       | 1.80       |
| Nominal Input Current (Watt)                                     | 448        | 442        | 429       | 428        | 427        |
| Maximum Input Current (Vrms)                                     | 6.73       | 5.47       | 3.05      | 2.88       | 2.63       |
| Maximum Input Current (Watt)                                     | 669        | 654        | 630       | 628        | 626        |
| Efficiency (ratio of DC output to real input power at 499 Watts) | 0.73       | 0.73       | 0.78      | 0.78       | 0.78       |
| Inrush Current   | 65 Amps    | 65 Amps    | 65 Amps   | 65 Amps    | 65 Amps    |

### Technical Specifications

|  |  |  |                                |  |
|--|--|--|--------------------------------|--|
| <b>System Unit -<br/>DL380 G4 Server</b> | <b>Dimensions (HxWxD)</b>                              | 3.38 x 17.5 x 25.75 in (8.59 x 44.45 x 65.40 cm)   |                                |  |
|  | <b>Weight</b>  | Maximum  | 60 lb (27.22 kg)               |  |
|  |  | No drives  | 47.18 lb (20.41 kg)            |  |
|  | <b>Input Requirements</b><br>(per power supply)        | Range Line Voltage   | 100 to 132 VAC/180 to 265 VAC  |  |
|  |  | Rated Input Current  | 7.5A (100VAC) to 3.8A (200VAC) |  |
|  |  | Rated Input Frequency  | 50 to 60 Hz                    |  |
|  |  | Rated Input Power  | 735W                           |  |
|  | <b>BTU Rating</b>                                      | 2,508 BTU/HR   |                                |  |
|  | <b>Power Specifications</b>                            | To review typical system power ratings use the Active Answers Power Calculator which is available via the online tool located at URL:<br><a href="http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls">http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls</a><br>To drill down to calculators:<br>- Click on: "ProLiant Servers"<br>- Click on the Server of interest. Example: DL380 G4 Packaged Cluster<br>- Click on: "Power Calculator" link. (You may need to scroll down to see it) |                                |  |
|  | <b>SCSI Connectors</b>                                 | One external VHDCI connector   |                                |  |
|  | <b>Power Supply Output Power</b><br>(per power supply) | Rated Steady-State Power   | 575W                           |  |
|  |  | Maximum Peak Power   | 57W                            |  |
|  | <b>Temperature Range</b>                               | Operating  | 50° to 95° F (10° to 35° C)    |  |
|  |  | Shipping   | -22° to 122° F (-30° to 50° C) |  |
|  | <b>Relative Humidity</b><br>(non-condensing)           | Operating  | 10% to 90%                     |  |
| Shipping                                 |  | 5% to 95%  |                                |  |
| <b>Maximum Wet Bulb Temperature</b>      | 82.4° F (28° C)  |  |                                |  |
| <b>Acoustic Noise</b>                    | Idle (Fixed Disk Drives Spinning)                      |  |                                |  |
|  | L WAd (BELS)   | 7.4  |                                |  |
|  | L pAm (dBA)  | 58   |                                |  |
|  | Operating (Random Seeks to Fixed Disks)                |  |                                |  |
|  | L WAd (BELS)   | 7.4  |                                |  |
|  | L pAm (dBA)  | 58   |                                |  |

---

|                         |                   |   |                   |
|-------------------------|-------------------|---|-------------------|
| <b>Packaged Cluster</b> | <b>Dimensions</b> | 16 x 21 x 29 in (17.5 x 48.3 x 52.1 cm)                   |                   |
|                         | <b>Weight</b>     | Standard Configuration<br>(No drives dual power supplies) | 190 lb (86.18 kg) |

---

### Technical Specifications

|   |                        |  |   |
|---|------------------------|--|---|
| Low-Profile 24X Max<br>IDE CD-ROM Drive | Disk                   | Applicable Disk                                | CD-DA, CD-ROM (Mode 1 and 2)<br>CD-XA, CD-I (Mode 2, Form 1 and 2)<br>CD-I Ready, CD Extra, Video CD, CD-Bridge<br>Photo CD (Single and Multi-session)<br>CD-WO |
|   |                        | Capacity                                       | 550 MB (Mode 1, 12 cm)<br>640 MB (Mode 2, 12 cm)  |
|   |                        | Diameter                                       | 4.7 x 3.15 in (12 x 8 cm)   |
|   |                        | Rotational Speed                               | 4200 rpm maximum  |
|   |                        | Center Hole                                    | 0.6 in (15 mm) diameter   |
|   |                        | Thickness                                      | 1.2 mm  |
|   |                        | Track Pitch                                    | 1.6 $\mu$ m   |
|   | Block Size             | Mode 0   | 2,368, 2,352 bytes  |
|   |                        | Mode 1   | 2,352, 2,340, 2,336, 2,048 bytes  |
|   |                        | Mode 2   | 2,352, 2,340, 2,336, 2,048 bytes  |
|   | Interface              | IDE (ATAPI)                                    |   |
|   | Access Times (typical) | Random   | < 140 ms  |
|   |                        | Full-Stroke                                    | < 300 ms  |
|   | Data Transfer Rate     | Sustained                                      | 150 KB/s (sustained 1X)   |
|   |                        | Burst  | 2100 to 4800 KB/s   |
| Cache Buffer                            | 128 KB                 |  |   |
| Start-up Time (typical)                 | < 10 seconds           |  |   |
| Stop Time                               | < 5 seconds            |  |   |
| Operating Conditions                    | Temperature            | 41° to 120° F (5° to 55° C)                    |   |
|   | Humidity               | 10% to 80%                                     |   |
| Dimensions                              | (H x W x D, maximum)   | 0.51 x 5.24 x 5.2 in (1.30 x 13.31 x 13.21 cm) |   |
|   | Weight                 | < 340 g  |   |

|  |  |  |
|--|--|--|
| Integrated Smart Array<br>6i Plus Controller | Data Compatible with all<br>Smart Array Controllers  | Yes  |
|  | Instant Upgrades to other<br>Smart Array Controllers | Yes  |
|  | Consistent Software<br>Manageability Tools           | Yes  |
|  | PCI-X Bus  | 64-bit, 133 MHz (integrated on system board)   |
|  | PCI-X Peak Data Transfer<br>Rate                     | 800 MB/s   |
|  | SCSI Protocols Supported                             | Ultra320, Ultra3, Ultra 2  |
|  | SCSI Peak Data Transfer<br>Rate                      | 320 MB/s per channel   |
|  |  | <b>NOTE:</b> For ProLiant servers having TWO internal drive bays on separate SCSI ports: SCSI Peak Data Transfer Rate is 320 MB/s total; 160 MB/s per channel and Channels is 2. |
|  |  |  |
|  |  |  |

### Technical Specifications

|  |  |  |
|--|--|--|
| <b>Channels</b>                          | 2  | <b>NOTE:</b> For ProLiant servers having two internal drive bays on separate SCSI ports: SCSI Peak Data Transfer Rate is 320 MB/s total; 160 MB/s per channel and Channels is 2. |
| <b>SCSI Ports</b><br>(external/internal) | 0/2  | <b>NOTE:</b> For ProLiant servers having two internal drive bays on separate SCSI ports: SCSI Peak Data Transfer Rate is 320 MB/s total; 160 MB/s per channel and Channels is 2. |
| <b>Drives Supported</b><br>(maximum)     | Maximum = total number of drives   | <b>NOTE:</b> Maximum is the total number of internal drives on each specific ProLiant server.  |
| <b>Cache</b>                             | 64 MB Read and/or Write Cache  |  |
| <b>Battery-Backed Write Cache</b>        | Yes, with installation of Battery-Backed Write Cache Enabler, up to 64MB |  |
| <b>RAID Support</b>                      | 0, 1, 1+0, 5   |  |
| <b>Logical Drives</b><br>(maximum)       | Maximum = total number of drives   |  |
| <b>Online Configuration</b>              | Yes  |  |
| <b>Online Capacity Expansion</b>         | Yes  |  |
| <b>Logical Drive Capacity Extension</b>  | Yes  |  |
| <b>Online Stripe Size Migration</b>      | Yes  |  |
| <b>Online RAID Level Migration</b>       | Yes  |  |
| <b>Online Spare Support</b>              | Yes  |  |
| <b>Automatic Data Recovery</b>           | Yes  |  |
| <b>Drive Roaming</b>                     | Yes  |  |
| <b>Redundant Controllers</b>             | No   |  |

NC7782 Dual PCI-X  
Gigabit NIC (embedded)  
10/100/1000 WOL  
(Wake On LAN)

|                              |                                    |  |
|------------------------------|------------------------------------|--|
| <b>Network Interface</b>     | 10Base-T/100Base-TX/1000 BaseTX    |  |
| <b>Compatibility</b>         | IEEE 802.3/802.3u compliant        |  |
| <b>Data Transfer Method</b>  | 64-bit bus-master PCI-X            |  |
| <b>Network Transfer Rate</b> | 10Base-T (Half-Duplex)             | 10 Mb/s  |
|                              | 10Base-T (Full-Duplex)             | 20 Mb/s  |
|                              | 100Base-TX (Half-Duplex)           | 100 Mb/s                                       |
|                              | 100Base-TX (Full-Duplex)           | 200 Mb/s                                       |
|                              | 1000Base-TX (Full-Duplex)          | 2000 Mb/s                                      |
|                              | 1000Base-TX (Half and Full-Duplex) | 2000 Mb/s                                      |
| <b>Connector</b>             | RJ-45                              |  |
| <b>Cable Support</b>         | 10Base-T                           | Categories 3, 4 or 5 UTP; up to 328 ft (100 m) |
|                              | 100Base-TX                         | Category 5 UTP; up to 328 ft (100 m)           |
|                              | 1000Base-TX                        | Category 5 UTP; up to 328 ft (100 m)           |

### Technical Specifications

|                            |   |  |   |
|----------------------------|---|--|---|
| Modular Smart Array 1000   | LED Indicators on Front (3)   | Power<br>Fault detected in one or more sub-systems<br>Fault in Enclosure Management  |   |
|                            | LED Indicators for Drive Modules (3)  | Drive Access (center)<br>Online (left)<br>Drive Failure (right)  |   |
|                            | LED Indicators on Rear Panel (4)  | Power Supply/Blower Assembly Fault (1)<br>EMU (3) Power, A bus, B bus  |   |
|                            | Interface   | Ultra3 SCSI to Hard Drives<br>2 Gb Fibre Channel to Hosts  |   |
|                            | Maximum Number of Drives  | Fourteen, 1-inch HP Ultra2, Ultra3 or Ultra320 Universal Hard Drives (MSA1000 Cabinet); expandable to 42 using two additional HP StorageWorks 4200/4300 Enclosures   |   |
|                            | Temperature Range   | Operating  | 50° to 95° F (10° to 35° C)   |
|                            |   | Shipping   | -22° to 122° F (-30° to 50° C)<br><b>NOTE:</b> Derated 1° C per 1,000 ft of elevation to 10,000 ft. |
|                            | Relative Humidity   | Operating  | 10% to 90%  |
|                            |   | Non-operating  | Up to 95%   |
|                            | Input Power Requirements  | Rated Input Voltage  | 100 to 240 VAC  |
| Rated Input Frequency      |   | 50 to 60 Hz  |   |
| Rated Input Current        |   | 6 A Max  |   |
| Input Power (max)          |   | 549 W*   |   |
| Heat Dissipation (max)     | 1876 Btu/hr*  | <b>NOTE:</b> Input Power and Heat Dissipation specifications are maximum values and apply to worst-case conditions at full rated power supply load. The power/heat dissipation for your installation will vary depending on the equipment configuration. |   |
| MSA1000 Cabinet            | 4U Rack Form Factor   |  |   |
|                            | Dimensions (H x W x D)  | 6.9 x 19 x 20.5 in (17.5 x 48.3 x 52.1 cm)   |   |
|                            | Weight  | Net 55 to 85 lb (24.95 to 38.56 kg)  |   |
| User Interface             | Controller display with Status Indicators (2) and push buttons (4) on front of controller |  |   |
| Electrical Interface       | LVD (Low Voltage Differential)  |  |   |
| Protocol Support           | Wide Ultra3 SCSI  |  |   |
| SCSI Ports                 | 4-channel: 2 internal, 2 external   |  |   |
| Drives Supported           | Up to 42 drives   |  |   |
| Maximum Capacity           | 6TB (42 drives x 146GB)   |  |   |
| Logical Drives (LUN)       | Up to 32 Logical Drives   |  |   |
| Maximum Logical Drive size | 2.0TB   |  |   |

### Technical Specifications

|  |  |  |
|--|--|--|
| <b>Modular Smart Array 1000 Controller</b><br>218231-B22 | <b>User Interface</b><br><br><b>Electrical Interface</b><br><b>Protocol Support</b><br><b>SCSI Ports</b><br><b>Drives Supported</b><br><b>Maximum Capacity</b><br><b>Logical Drives</b><br><b>RAID Support</b><br><br><b>Cache Memory</b><br><br><b>Cache Batteries</b><br><b>Upgradeable Firmware</b><br><b>Disk Drive and Enclosure Protocol Support</b><br><b>Temperature Range</b> | Controller Display with Status Indicators (2) and Push Buttons (4)<br>Status Indicators on front of Controller (16)<br><br>LVD (Low Voltage Differential)<br>Wide Ultra3 SCSI (160 MB/s per channel)<br>4-channel: 2 external/2 Internal<br>Up to 42 drives<br>6.0 TB (42 drives x 146 GB)<br>Up to 32 logical drives<br>RAID ADG (Advanced Data Guarding)<br>RAID 5 (Distributed Data Guarding)<br>RAID 1+0 (Striping & Mirroring)<br>RAID Support<br><br>Up to 512 MB Read/Write (256 MB modules). If redundant controllers are used they must have equally configured cache<br>ECC protection, battery-backed, and removable<br>Standard as of November 19, 2002: 256 MB cache memory (single module)<br><br>Up to three days of redundant battery life, removable for easy replacement<br>2 MB flashable ROM<br>HP Ultra320, Ultra3, and Ultra2 SCSI 1-inch Universal drives<br><br><b>Dimensions</b> (L x W x D)    17 x 12.5 x 7.75 in (43.2 x 31.75 x 19.7 cm)<br><b>Weight</b> (Gross)                6 lb (2.72 kg) |
|--|--|--|

|  |   |   |
|--|---|---|
| <b>MSA Fabric Switch 2/8</b><br>288247-B21 | <b>Performance</b><br><br><b>Interoperability</b><br>(NOTE: Products listed may be discontinued.)<br><b>Switch bandwidth</b><br><b>Maximum frame size</b><br><b>Port types</b><br><br><b>Media types</b><br><br><b>Classes of service</b><br><b>Management access</b><br><b>Management</b><br><br><b>Security</b> | 2.125 Gbit/sec line speed, full duplex ;1.063 Gbit/sec line speed, full duplex; Auto-sensing of 1 Gbit/sec and 2 Gbit/sec port speeds; optionally programmable to fixed port speed; Speed matching between 1 Gbit/sec and 2 Gbit/sec ports Aggregate bandwidth 64 Gbit/sec end to end Fabric latency <2.1 μsec with no contention, cut-through routing at 2 Gbit/sec<br><br>SAN Switch 2/8-EL, SAN Switch 2/16-EL, SAN Switch 2/32, SAN Switch 2/64, SAN Switch 8, SAN Switch 16, SAN Switch 8-EL, SAN Switch 16-EL, Integrated/32, Integrated/64<br>32 Gbit/sec end to end<br>2112-byte payload<br>8 ports universal (one internal, seven external), FL_Port, F_Port, and E_Port; self-discovery based on switch type (U_Port)<br><br>Small form-factor pluggable (SFP) four included standard; short wavelength (SWL) up to .31 mi (500m), long wavelength (LWL) up to 21 mi ( 35 km); distance depends on fiber-optic cable and port speed<br><br>Class 2, Class 3, Class F (inter-switch frames)<br>10/100 Ethernet port (RJ-45); Serial port (RS-232)<br>Advanced Web Tools included; Fabric Manager (optional) Management access In-band via Management Server.<br><br>Fabric security for configuration management, SAN access, and authentication/authorization |
|--|---|---|

### Technical Specifications

|                               |   |  |                                       |
|-------------------------------|---|--|---------------------------------------|
| <b>Supported software</b>     | Telnet, SNMP, WEBTOOLS, Zoning, Fabric Watch, Extended Fabrics, Remote Switch, Trunking, Advanced Performance Monitoring  |  |                                       |
| <b>Fabric services</b>        | Simple Name Server, Registered State Change Notification (RSN), Alias Server (multicast); and Zoning, WEB TOOLS. Optional QuickLoop, Fabric Watch, Extended Fabrics, and Remote Switch, Trunking, Advanced Performance Monitoring |  |                                       |
| <b>Diagnostics</b>            | Diagnostics POST and embedded online/offline diagnostics  |  |                                       |
| <b>Dimensions (H x W x D)</b> | SAN Switch 2/8: 7.75 x 12.5 x 17 in (19.68 x 31.75 x 43.18 cm)  |  |                                       |
| <b>Shipping</b>               | 6 lb (2.72.kg)  |  |                                       |
| <b>Humidity range</b>         | 5% to 85% non-condensing at 104° F (40° C)  |  |                                       |
| <b>Environment</b>            | <b>Temperature</b>  | <b>Operating</b>                       | 32° F to 104° F<br>(0° C to 40° C)    |
|                               |   | <b>Non-operating</b>                   | -31° F to 147° F<br>(-25° C to 70° C) |
|                               | <b>Vibration</b>  | <b>Operating</b>                       | 0.5 G p-p, 5-500 Hz                   |
|                               |   | <b>Non-operating</b>                   | 2.0 G p-p, 5-500 Hz                   |
| <b>Connector Type</b>         | LC  |  |                                       |
| <b>Protocol</b>               | SCSI, IP  |  |                                       |
| <b>Data Transfer Method</b>   | 64-bit/66 MHz PCI   |  |                                       |
| <b>Maximum Transfer Rate</b>  | 200 MB  |  |                                       |
| <b>Packaging</b>              | <b>Dimensions (L x W x D)</b>   | 11 x 8.5 x 3 in (27.9 x 21.6 x 7.6 cm) |                                       |
|                               | <b>Weight (Gross)</b>   | 1 lb (0.45 kg)                         |                                       |

### Multi-Mode Fibre Channel Cables Kits 218960-B21

|                                |   |  |  |
|--------------------------------|---|--|--|
| <b>Cable Type</b>              | LC-LC (2 Gb to 2 Gb connections) and LC-SC (2 Gb to 1 Gb connections)<br>50 Micron multi-mode Fiber |  |  |
| <b>Available Cable Lengths</b> | 6.5 ft, 16.4 ft, and 49.2 ft (2 m, 5 m, and 15 m)   |  |  |
| <b>Packaging</b>               | <b>Dimensions (L x W x D)</b>   | 11.5 x 9 x 1.5 in (29.2 x 22.8 x 3.8 cm) |  |
|                                | <b>Weight (Gross)</b>   | 0.75 to 1 lb (0.34 to 0.45 kg)           |  |

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